ICE AND Refrigeration

hjb

PUBLISHED BY NICKERSON & COLLINS CO., CHICAGO - NEW YORK

58th YEAR ★ OCTOBER, 1949

KEEP COMPRESSORS AND SYSTEMS CLEAN

Use the lubricant that assures efficient operation Texaco Capella Oil

WHATEVER type or size of refrigerating compressor you are operating, you can get maximum output from it, at the lowest possible operating and maintenance cost, by lubricating with *Texaco Capella Oil*.

Texaco Capella Oils are highly refined lubricants . . . moisture-free . . . non-reactive with refrigerants, very low pour test. They have very high resistance to oxidation, gumming and sludging . . . keep compressors clean . . . help increase the efficiency of the whole system.

You can get *Texaco Capella Oils* in every needed viscosity. Let a Texaco Lubrication Engineer recommend the right ones for your particular operating conditions. Just call the nearest of the more than 2300 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO Capella Oils

FOR ALL AIR CONDITIONING AND REFRIGERATING EQUIPMENT

ICE AND REFRIGERATION, Vol. 117, No. 4. Published monthly at 433 N. Waller Ave., Chicago, Ill., U.S.A., by Nickerson & Collins Co. Yearly subscription in the U. S., $3.00 per year; other countries, $4.00. Single copies, 35 cents. Copyrighted 1949 by Nickerson & Collins Co. Entered as second-class matter August 8, 1891, Chicago, Ill., under the Act of March 3, 1879. Additional entry at Beloit, Wisc.

As a Sanitary Safeguard the New Haven R.R. uses Packaged Processed Ice!

A new diner of the New York, New Haven & Hartford. This railroad ices forty cars daily—diners, grill cars, lounge cars—with processed ice in Union one-trip paper ice bags.

Here's an Easy Way to Sell the Big Users of Processed Ice

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It's easy to see how one-trip paper bags save you money, too! They speed up handling at the ice processor, loading platform and in delivery. Customers do their own icing, using more ice and saving drivers' time.

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UNION Paper Ice Bags

A product of the UNION BAG & PAPER CORPORATION • Woolworth Bldg., New York 7, N. Y.

Bags of Kraft, Transparent Films, Waxed Paper, Glassine, Laminates

Save THE Martocello Way!

Yes, it's very simple to save when you use a MARTOCELLO CLEAR RAW WATER AIR AGITATION SYSTEM. Your initial cost is low, and the real savings come from producing CRYSTAL CLEAR ICE, which will appeal to the consumer. More sales mean more profits —profits mean more money in the bank. So remember this very important fact—

PRODUCE BETTER ICE - *use a*

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More and more users daily are finding this to be true. Why not think of this very important part of your plant and send us your requirements today. We would be pleased to send you our recommendations and quotations without obligation.

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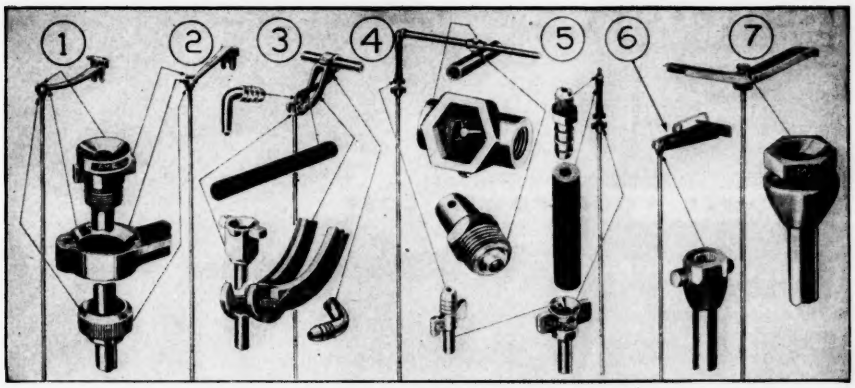
"Serving the Ice Industry Since 1916"..."There is no Substitute for MARTOCELLO QUALITY"

SO MUCH .... *for so little*

For So Little Time and Money Invested

You Can SAVE So Much!

Install a Martocello Air System in your plant and SEE the difference. You are assured of a CRYSTAL CLEAR, CLEAN, and PURE block of ice EVERYTIME!



MARTOCELLO AIR AGITATION SYSTEMS

1. **MARTOCELLO SELF-CENTERING DROP TUBE BRACKET, OFFSET FORM** is recommended for individual loose can requirements. This bracket enables the removal of tubes at the Dip Tank, resulting in cleaner tank top, saving of time and less maintenance. The Self Centering Tube is free to swing in all directions. The Bracket is NON-CORROSIVE and made of strong Manganese Bronze.
2. **MARTOCELLO SELF-CENTERING DROP TUBE BRACKET, STRAIGHT FORM** is a desirable replacement assembly for all types of Pressed Steel Bracket arrangements. The bracket is made of NON-CORROSIVE Manganese Bronze.
3. **MARTOCELLO SERIES DROP TUBE BRACKET** is recommended for group handling of cans, permitting removal of tubes at the Dip Tank. Lateral is off center, making lift points accessible with lateral and tubes in position. Drop Tubes are maintained central yet free to rock lengthwise of the can. Brackets are made of NON-CORROSIVE Manganese Bronze.
4. **DOUBLE BRACKET SYSTEM ASSEMBLY** and parts with many exclusive and desirable features to improve existing similar systems.
5. **SERIES DROP TUBE ASSEMBLY** is recommended and adaptable to improve many old style existing systems, as well as used on new installations.
6. **GALVANIZED STEEL TRUNNION TYPE BRACKET ASSEMBLY.** Including latest improved parts, carried in stock for prompt shipment.
7. **GALVANIZED STEEL SADDLE BRACKET ASSEMBLY.** All parts carried in stock for prompt shipment.

(When ordering give inside dimensions of Ice Can.)

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TO CUT POWER COST

AND BOOST TONNAGE WITH

Vogt BRINE COOLERS

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ASK FOR BULLETIN BC2

DOWN GOES POWER COST AND UP GOES TONNAGE when old evaporators are replaced with modern, Vogt Brine Coolers. The reason . . . maximum evaporating surface packed into a minimum of space with correct design and sound construction the controlling factors.

Vertical Multipass type coolers can be furnished for use where floor space is limited and ample head room is available.

MULTIPASS TYPE

The cooler for closed brine systems in cold storage plants, dairies, packing plants, oil refineries, etc., requiring units of large capacity.

LOWER YOUR POWER COST

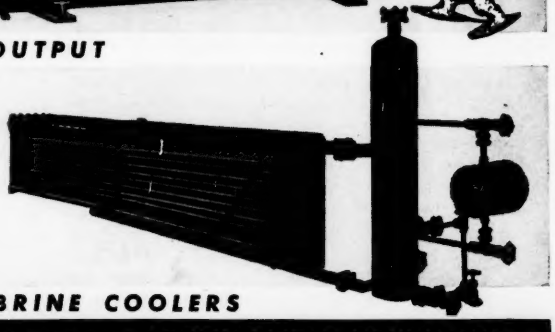
SINGLEPASS TYPE

Standard for ice freezing tanks and ideal where multiple can lifts are used. Large gas liberation area and rapid circulation of brine makes this a very efficient unit.

RAISE TONNAGE OUTPUT

COIL TYPE

Recommended for ice freezing tanks and other refrigerating purposes where space is limited. The gas is quickly liberated and a high rate of heat transfer is effected.



INSTALL MODERN VOGT BRINE COOLERS

HENRY VOGT MACHINE CO., Inc., ... LOUISVILLE 10, KENTUCKY

Branch Offices: New York - Chicago - Cleveland - Philadelphia - Dallas

"CATERPILLAR" KEEPS THEM FRESH

A large share of all the fruits, vegetables and other perishables moving from the Pacific Coast to the big Eastern markets passes over the Toledo, Peoria & Western Railroad. When the long trains of "reefers" roll into the T.P.&W.'s yards, a heavy blanket of snow ice is blown into the cars.

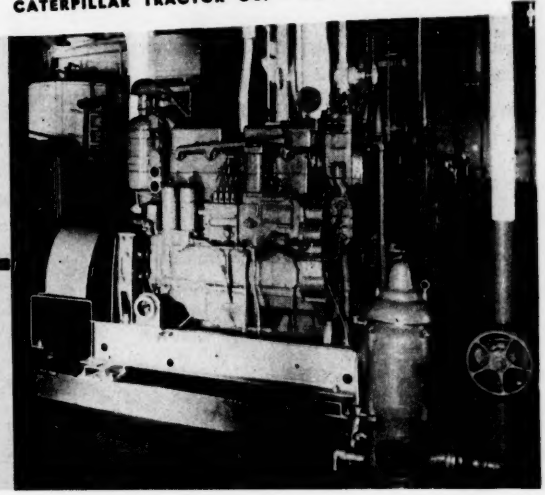
On the job to make sure these perishable products reach the end of their journey with all their freshness intact are three "Cat" Diesel Engines. They power a York refrigeration compressor that makes 40 tons of snow ice and bunker ice per day.

Two of these engines are veteran "Caterpillar" Diesel D7700s that have worked 24 hours a day in summer – 16 hours in winter – for 16 years! The third is a newer "Cat" Diesel D8800 Engine. J. H. Lowry, plant superintendent, shown at the hoist, says:

"These 'Cat' Engines and the 'Caterpillar' dealer who services them are top-notch, any way you look at it!"

Send the coupon today for more information about long-life, dependable "Caterpillar" power for the ice and refrigeration industry.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS



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DIESEL ENGINES • TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

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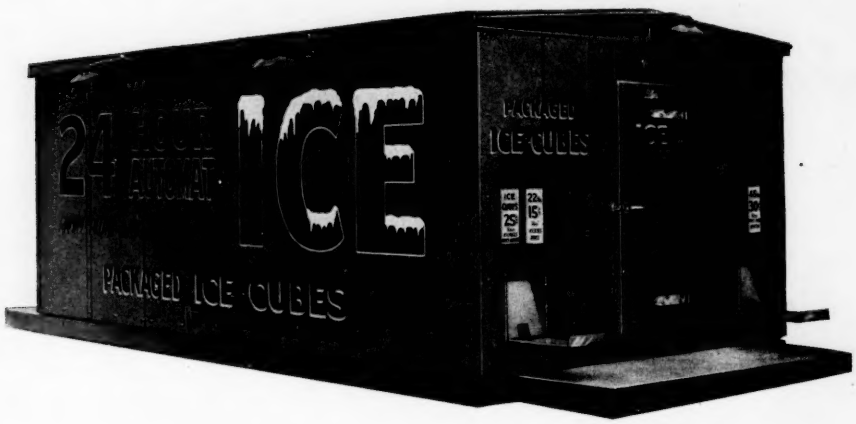
Send me a copy of your booklet, "Refrigeration Assured."

Name_____

Address_____

Another **POLAR** *Installation*
Selling More Ice **AUTOMATICALLY**



Operators of Polar Aluminum Ice Vending Stations report increases in ice sales of from 25 to 50%! You, too, can depend on service-tested Polar equipment to boost your sales and profits.

A Polar Station *sells more ice automatically* by making it available in convenient locations 24 HOURS A DAY, EVERY DAY IN THE YEAR! A Polar Station vends block ice or bags of cubes. It has ample storage space and operates economically. Zero temperature guaranteed at 95° outside temperature.

NOW is the time to investigate the profit possibilities of merchandising ice the Polar way for more ice sales . . . for more ice profits, at LOWER DISTRIBUTION COSTS! WRITE TODAY FOR COMPLETE INFORMATION.

Visit us at Booth #38 at the National Convention in New York, Nov. 15-18th.

REFRIGERATION ENGINEERING COMPANY
211 Foshay Tower, Minneapolis 2, Minn.

Send me your 1950 catalog on POLAR ice vending stations

Name_____

Address_____

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POLAR ICE VENDING STATIONS—

***FIRST* with aluminum construction**
***FIRST* with coin accumulator**
***FIRST* with automatic electric defrost**

We will continue to pioneer new developments in automatic ice vending and will incorporate new improvements in our standard line of Polar Stations and vendors. The 1950 line of Polar Equipment features many "extras" now available to you at no extra cost.

NEW! THE POLAR JUNIOR ICE VENDING STATION. Completely assembled at our factory, it is shipped on skids ready to be put into operation on arrival at your location. The Polar Junior Station comes equipped with vendors and features the same high quality construction as the Deluxe Sectional Models. Write for literature.

REFRIGERATION ENGINEERING CO.

211 Foshay Tower, Minneapolis 2, Minn.

HOWE

KEEP YOUR PRODUCTS at peak-of-perfection and push up profits with Howe Refrigeration Equipment! Provides that exact temperature and humidity control which saves money, time, labor. Quick freezing and frozen food locker plants, meat packers, ice cream and dairy plants, ice and cold storage plants, all are profiting by Howe's tested-and-proved refrigeration knowledge, acquired through 37 years as specialists. Howe equipment is correctly designed and engineered for top performance . . . ruggedly built to precision standards . . flexible to handle peak loads economically.

Two 20-Ton Machines for Quick Freezing

CONSULT HOWE on all your refrigeration problems. Since 1912 manufacturers of ammonia compressors, condensers, coolers, fin coils, locker freezing units, air conditioning (cooling) equipment. Immediate delivery!

A few territories for new Distributors are available. Your inquiry invited!

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Tell us more. Please send literature.

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Position.....

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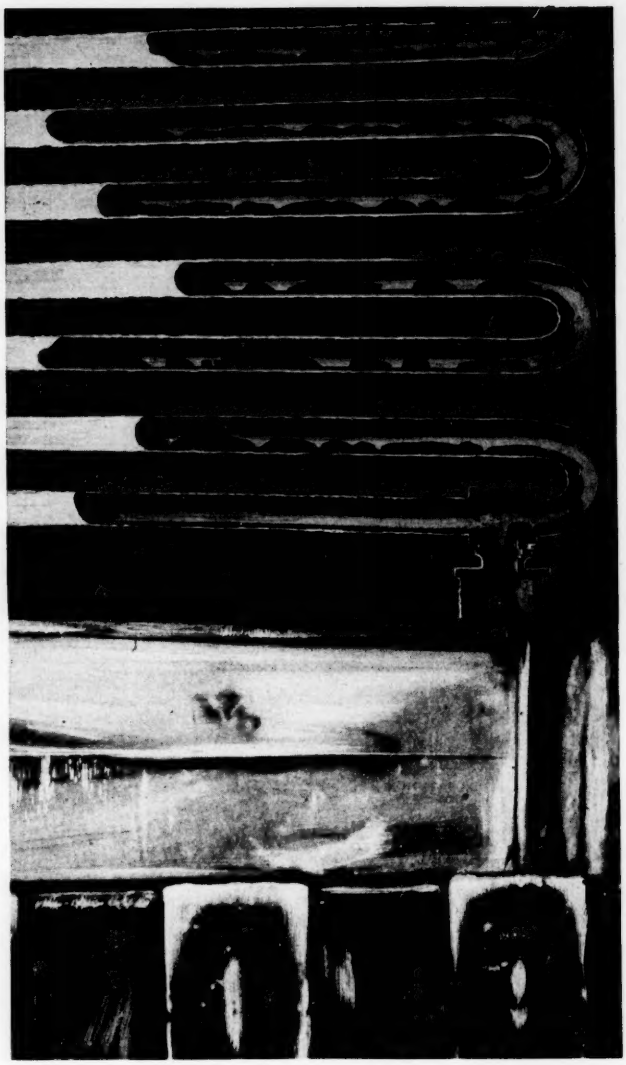
Inside Knowledge on Lubrication Problems

FREEZING TEMPERATURES

This is One of a Series of Messages on Common Problems in Your Plant

Won't Congeal in Cooling Coils!



REFRIGERATION capacity depends on efficient heat transfer in the evaporator coils. Congealed oil on evaporator surfaces slows heat transfer, cuts capacity.

Gargoyle Arctic Oils for compressors attack this problem 3 ways.

1. They remain liquid at sub-zero temperatures, drain from the evaporator.
2. They do not tend to form deposits that coat heat transfer surfaces, clog expansion valves.
3. Because of their high lubricating efficiency, they may be fed sparingly, so that little is carried over into the refrigeration system.

Gargoyle Arctic Oils also stand up under the high temperatures of the compressor. They resist the formation of deposits that interfere with free operation of valves, maintain correct viscosity and form tight piston seals.

Get these proved oils in your refrigeration system.

SOCONY-VACUUM OIL CO., INC.
and Affiliates: Magnolia Petroleum Company
General Petroleum Corporation

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SOCONY-VACUUM

Socony-Vacuum Correct Lubrication

FOR EVERY MACHINE . . . EVERY OPERATING CONDITION

J. F. NICKERSON, Founder

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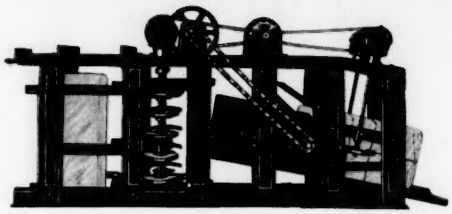
★ Perfection A MODEL FOR EVERY REQUIREMENT ★

PERFECTION REGULAR

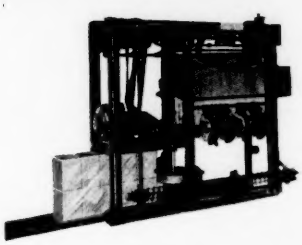


The Perfection REGULAR receives the ice block standing on end, scoring it crosswise first. Then the block enters the tilting cage which turns the block down and it slides by gravity through another set of saws that score it lengthwise. In one operation the REGULAR will score the blocks into any size pieces desired. This machine in 300 and 400 pound size, is 31 inches wide with saw guards in place, or 26 inches wide with saw guards removed. Capacity is six blocks per minute or 360 blocks per hour.

PERFECTION SPECIAL

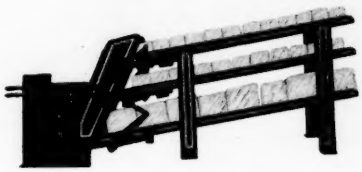
The PERFECTION SPECIAL receives ice blocks on edge, scores them lengthwise first. Then heads up the blocks, scores them crosswise and discharges them standing on end. This is a combined heading and scoring machine and scores the blocks into any size pieces desired in one complete operation. Capacity is 4½ blocks per minute or 270 blocks per hour.

PERFECTION "MILLER"



The MILLER machine receives the ice block lengthwise on edge. It is first lifted up and scored crosswise, passing the same saws again on the way down. It is then (without leaving the machine) automatically conveyed through the saws which score it lengthwise. Only one operation is necessary for complete scoring. Block is put through machine only once. The capacity is six blocks per minute, or with 300 lb. blocks, over 50 tons per hour. With 400 lb. blocks this output is increased to 65 tons per hour.

PERFECTION ICE CHUTE



A Perfection Ice Chute offers progressive ice merchandisers the surest way to give such service. Just pull a lever, out comes a cake of ice. The job is done in one-tenth of the time required under old methods. Customers are pleased. . . . Costly refrigeration is saved. . . . Business is increased. . . . Profits multiplied. The ice chute is built in two types; the straight chute, and the parallel.

The Old Reliable Perfections have been known for their rugged dependability and long life for more than two decades.

Repair parts for all current models available for immediate shipment.

WRITE FOR MORE INFORMATION

IN THIS ISSUE –

Standard Costs

Standardized methods of cost finding is important to refrigerated warehouse operators as a means of insuring that they all develop their cost figures on a comparable basis. Some of the more outstanding phases of this important subject are discussed by D. O. Haynes who has made a special study of handling methods in cold storage houses. The article starts on page 13.

Transportation of Frozen Foods

The needs of the frozen foods industry for low temperature transportation has made it necessary to set higher standards of performance for refrigerator cars and to this end studies are constantly under way to find out how desired results can be accomplished with a minimum of cost to the shipper. A discussion of some of these improvements and some of the problems involved is given in the paper published on page 17.

New Air Conditioning System Is Flexible

The air conditioning system installed in the new 13-story building of the General Petroleum Corp. in Los Angeles, Calif., provides individual selection of temperatures for each office throughout the building. Basis of this flexibility is the twin-duct air distribution system. This and other features of the installation are described in the article on page 20.

Plants Supply Ice for Vegetable Shipping

The region around the Lower Rio Grande has become famous for its production of vegetables and citrus fruits. For handling the vast shipments of these products, refrigeration in large amounts are required and this is supplied by ice-making plants specially built for that purpose. Four of these plants are described and illustrated in the article on page 21.

National Ice Convention

A preview of the program of the National ice convention to be held November 15 to 18 is given on page 23. Most of the talks will be given by realistic and experienced ice company executives with one or two outside speakers. Early hotel reservations are advised.

Planning Maintenance

Many refrigeration plants throughout the country will shortly begin their programs of maintenance and repair of the equipment. The quality of the work and the results obtained will depend to a large extent on the planning and preparation already made. This fact is stressed by James Stubblefield in a well detailed and informative article on page 33. He shows how a good planning system is set up and goes on to a step by step analysis of a good plant maintenance program.

Peach Refrigeration Pays Dividends

To avoid spoilage of ripe peaches from producer to market the fruit must be started on its journey with a certain degree of "greenness." It has been found that hydrocooling the fruit before loading it in pre-iced refrigerated railway cars has resulted in greatly reducing loss by decay. A discussion of this subject and results obtained from a study at the Michigan Experiment Station is presented in the article on page 45.

Cold Storage Holdings

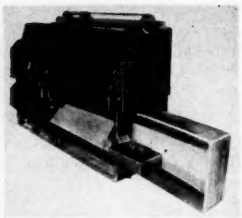
Little change occurred in cold storage occupancy during July, public coolers registering the same average occupancy on August 1 as on July 1 and a two-point raise in freezers. This is three points below the lowest previously recorded on August 1 for coolers and six points below for freezers. Additional details and statistics are shown in the summary on page 47.

National Locker Convention

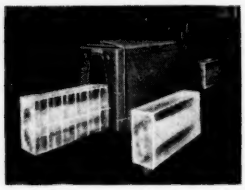
The Tenth annual convention of the National Frozen Food Locker Association was held at the Hotel Stevens Chicago, August 28-31. Theme of the program was based largely on the necessity of merchandising and advertising to offset decreased business. Formal papers and informal discussion of this and other subjects added up to a very successful meeting. Report of the convention on page 49.

Packing Helps Retain Flavor and Ascorbic Acid

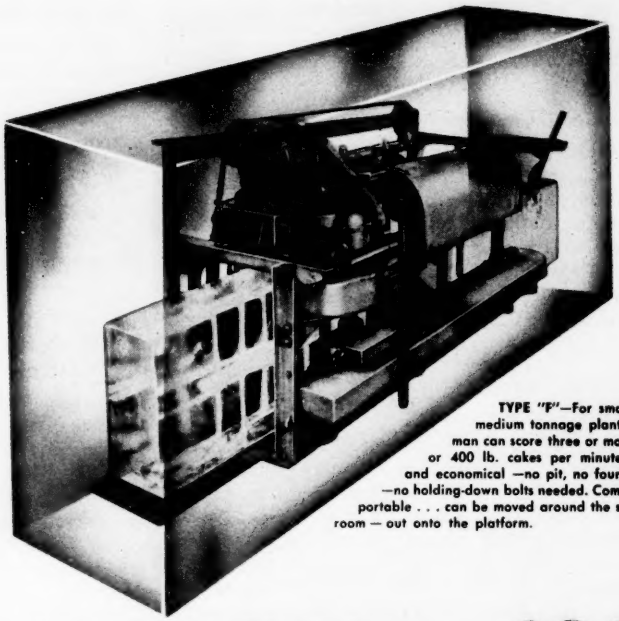
Study of frozen muskmelons, grapefruit and strawberry puree at the University of Illinois shows that the packing method is of greater significance than storage time in the retention of flavor and ascorbic acid. Details of how this investigation was conducted and a summary of the results obtained are given in the article on page 51.



TYPE "G"—The scoring machine the industry has been waiting for — a simple streamlined, compact, safe, automatic machine at a medium price. Semi-portable; requires no pit. A turn of the starting lever starts each scoring cycle — and it is automatically completed.



TYPE "UM"—A precision-built, fully automatic machine that accurately scores at the rate of 6 cakes (300 or 400 lb.) per minute. Feed and discharge conveyors are built integral with the scorer for straight-line operation.



TYPE "F"—For small and medium tonnage plants. One man can score three or more 300 or 400 lb. cakes per minute. Safe and economical —no pit, no foundation —no holding-down bolts needed. Completely portable . . . can be moved around the storage room — out onto the platform.

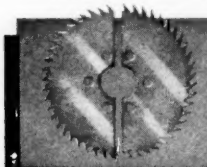
Clean, even scoring builds business -- WHEN YOU SCORE *ICE* USE G-W MACHINES

Users of G-W Type "F" Scoring Machines know their clean, even-scoring operation . . . how their economy in ice scoring will build up their business, reduce delivery costs. They know, too, all about their economical maintenance because they are "built to last." Says one user: "Our Type 'F' Scorer has been in constant use for nearly 14 years and has required very few repairs. It's given the best service of any piece of equipment we have bought since we started in business in 1906."

And now the new Type "G" brings automatic scoring to a medium priced unit! More rugged than the Type "F" and as precision-built as the Type "UM" — the new Type "G" Scorer is priced within the reach of every ice plant.

Type "UM" combines scoring with handling through its straight-line feeder and discharge conveyor.

Any of these G-W Scoring Machines will meet your plant conditions of tonnage and size requirements. Get in touch with a G-W engineer today — and SCORE ICE faster . . . easier . . . cheaper.



And when you need SAWS be sure they're RIGHT ...get genuine G-W SAWS! Insist on genuine G-W saws for replacement in your G-W Cubing and Scoring Machines. They're identical with your original saws, so they've got to be right for your equipment.

G-W ICE TOOLS — A complete line of top-quality hand-tools . . . tongs, hooks, shavers, bars, chisels, etc. . . . designed to make manual handling of ice easy and safe—made tough to stand the gaff for years. Write for Bulletin No. 480.

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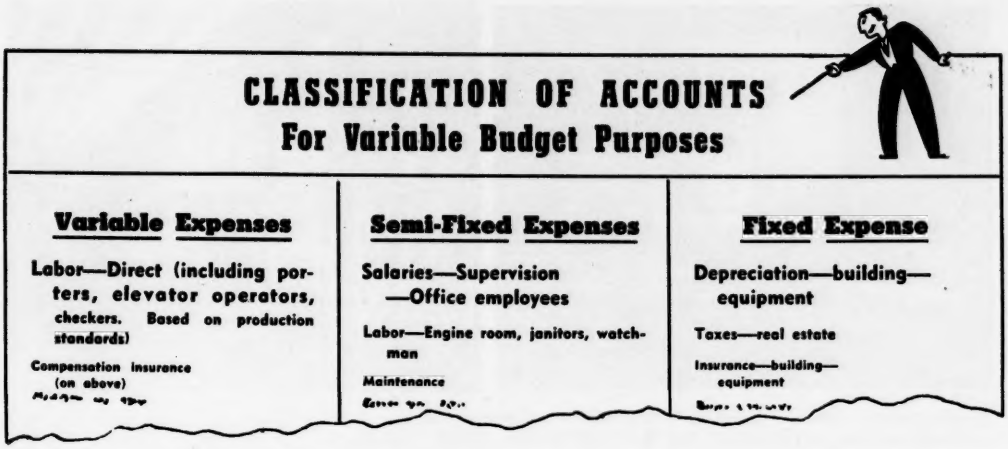


Why Not Go All Out for Standard Costs?

By D. Oliphant Haynes
Vice-president, Merchants Refrigerating Company
New York

While D. O. Haynes was recuperating from an operation he could not get around as rapidly as usual. But he continued to analyze operating methods and problems in refrigerated warehouses. This article is the result. The readers will remember his extensive series, "Modern Methods of Handling Refrigerated Commodities," Ice and Refrigeration, July 1947 through April 1948, which was widely read and continues to be much used as a reference source by the industry.

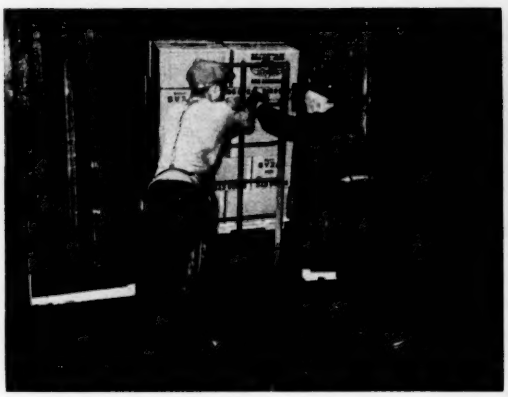
STANDARD is a very much overworked word. In discussions of costs and cost-finding methods it and its derivative *standardization* are tossed about freely without regard for the listener or reader who is not familiar with the technical accounting differences in which they are used. It is important for our present purpose to be sure that there is no confusion in the reader's mind regarding their meanings.

Standardization of basis for rates is a phrase which has become familiar to most executives in the cold storage industry due, no doubt, to a booklet bearing this title issued in 1921 by the national association of the industry. Although it was first distributed so many years ago the text still exerts considerable influence on the industry's thinking about cost-finding procedures. In recent years *standards* and *standard costs* are expressions which have been heard frequently in addresses delivered at accounting sessions of conventions. The uninitiated can easily fall into the error of thinking that these various terms are synonymous. Consider, for instance, a most constructive address made by W. C. Baker at the last convention of the National Association of Refrigerated Warehouses. "Merchandizing Through Cost Controls" makes out a strong case for both standardization of basis for rates and for production standards, but does not, in so many words, discriminate between the two (Ice & Refrigeration, April, 1949, pg. 51). The address deserves the wide distribution it has been given. It is a good job well done and should be given careful consideration by the entire industry. The present object is to clarify any possible confusion in terms and to propose a further extension of standard costs in the industry's accounting.

The expression standardization of basis for rates refers to a standardized method of cost finding. In the light of more recent developments in cost-accounting technique it would be more discriminating if the proposed standardized procedure was called a uniform cost-finding system. The basis for which standardization is suggested lies in the adoption by an industry of a uniform chart of accounts and uniform procedures in allocating expenses to those accounts. The very worthy purpose behind this kind of standardization is to insure all members of an industry developing their cost figures on a comparable basis. In this sense, therefore, standardization actually means uniformity in accounting methods.

Standard costs is a comparatively new expression, but it has been accepted generally in accounting circles, as meaning a technique by which, after thorough analysis, standard amounts are determined for each item of expense —and income—for a particular company. The standard amounts so established are made an integral part of the accounting records so that it is possible to compare actual results with their predetermined standards. As originally used, standard costs implied an inflexible standard for each item of expense.

The early advocates of this accounting method wanted the standards so set that comparisons would be made year after year with the activities of a business operating under



Manual Labor vs. Machine Handling—which results in lower over all costs? More man-hours must be balanced against equipment expenses and occasional loss of net piling space. Speed of handling and service enter the picture. Standard costs pave the way to the answer.

its own "normal" rate of production. The conception of flexible budgets was a later development which made it possible for the executives of a company to compare accomplishments against predetermined amounts set up for expense items under various volumes instead of against a theoretical "normal" operation. Standard costs will be used here in the sense of flexible budget costs.

In the first part of his talk Baker covers thoroughly and —despite his protestations to the contrary—competently the philosophy underlying a standard basis for rates, or, as we call it here, uniform cost accounting. The arguments which he advances in favor of this kind of accounting for an industry cannot be repeated too frequently. The adoption of uniform methods by an industry is a long-drawn-out process and it takes just such addresses as this to keep driving home the advantages to all concerned from uniformity in cost-finding methods.

The second part of Baker's paper is devoted to a discussion of production standards. His work in this field grew out of a program sponsored by some far-sighted executives. The Chicago Cold Storage Group engaged a firm of industrial engineers to investigate the feasibility of establishing production time standards for warehouse operations. Preliminary time studies indicated that it was not only possible but practical to do so and the work of adopting standards to individual cold storage plants in the area —among them Produce Terminal Cold Storage Co. with which Mr. Baker is associated—has been going forward.

Production Standards

Production standards are, of course, budget standards. Time studies are made in a given plant and with these as a basis the number of man-hours required for each type of operation is developed. By way of example, let us assume that the studies disclose, with due allowances for fatigue, delays, etc. the standard for unloading a carload consisting of 600 cases of shell eggs to be four man-hours. Standards must be determined for various kinds and weights of containers; in some instances allowances must be made for the kind of commodity, etc. They must also include all the various types of work done—car unloading, and loading, piling and unpiling merchandise in the storage rooms, etc.

At the end of any desired period the receipts and deliveries at the warehouse are converted into the number of standard man-hours represented by the work done in handling them. The total of these standard hours is then compared with the actual hours put in by the personnel covered by the work standards. With these two figures it is possible to compute the efficiency of the working force. Suppose, for example, that during a given week 600 standard man-hours of work are produced and during that same period the men put in 800 time-clock hours. Obviously, the force is working at 75 per cent efficiency. The plan can be extended to segregate the results of the work done by different gangs and thus compare the efficiencies of those assigned to cars, those on the truck platform and those in the warehouse proper—provided, of course, the records thus obtained are worth the effort of the extra paper-work involved and the necessity of having each man report his working time and location accurately.

From an accounting angle, production standards become the basis for labor expense budgeting. The dollar value of the standard man-hours produced and the actual payroll paid out to the men for their working hours reflects the loss or gain in direct labor—that is, how the budget is being met.

Production Standards Differ

An important point must not be lost sight of. Production standards are unique for a particular warehouse. The methods used in establishing these standards may be and should be uniform, but for a given plant the standard time for accomplishing a task is set for the conditions prevailing in that plant. Or, to put it another way, the standards are not industry standards but individual plant standards.

Certainly no one can or would want to quarrel with what Baker says about the advantages of production standards. He does not, however, carry the story to its ultimate conclusion. He fails to mention the possibility of extending the standard-cost principle to other items of handling expense. In a panel discussion on costs held at the annual convention of the American Warehousemen's Association in 1948 the Cold Storage Division listened to an explanation of standard costs by two engineers actively engaged in the work of determining standards for the Chicago Group. Most of the discussion centered about the methods used in setting up standards and the advantages to be derived from them. The question of standards for handling overhead (burden) items was touched on in passing, so to speak, and was scarcely given the consideration due its importance.

Budgeted Cost Accounting

It is but logical at this point to ask if standard or budgeted costs are useful tools for controlling direct labor and handling overhead costs, why not for other expense items? Why not go all out for budgeted cost accounting and cover both handling and storage costs?

This is not the place to go into all the ramifications of budgetary control. Suffice it to say that each item in the chart of expense accounts, which, incidentally, should be drawn up in conformity with the industry's uniform accounting procedure, is carefully studied and classified according to its degree of flexibility under different volume conditions.

Fixed, or as some prefer to call them, shut down expenses are those which must be carried even though the plant is operated by a standby force. Property taxes, depreciation —although this item can vary with the amount of use to which equipment is put—and certain salaries and wages are the kinds of expenses which fall in this category.

Semi-fixed items are those which vary, but not in direct relation to volume. Most items of expense fall in this group. Some jobs, for example, require a certain number of indirect workers and their services cannot be dispensed with in direct relation to volume changes. Watchmen, janitors and checkers are examples of workers in this classification. In warehousing few expenses are truly variable with volume. In manufacturing the cost of materials is the classic example of an expense that varies directly with volume. It should be noted, however, that even the cost of materials may vary when smaller amounts are purchased. The item in the warehouseman's budget which follows most closely the volume curve is direct labor. Production standards are used as the basis for budgeting direct labor.

It would seem to be unnecessary to say that the value of a flexible budget is in direct proportion to the honesty of thinking which goes into its preparation, but the point is well worth emphasizing. All too frequently items are classified as fixed which, under stress of falling volumes are reviewed and changed. The executive working on budget figures should face reality at the time. Unless he does so, he will find that he has developed a set of figures which are of little significance—a poor tool to help him in deciding what steps should be taken under given conditions. A well developed flexible budget is based on advance thinking. It points the way for action under any circumstances.

When the final flexible budget figures are ready all the data necessary for the preparation of a break-even chart for the company will have been compiled. Such a chart is a graphic representation of the flexible budget. It is an invaluable control in the economic management of a business.

The accounting progress made by the forward-looking group in Chicago is having a salutary effect on the industry's attitude toward new methods of controlling labor costs. Should the philosophy underlying labor budgeting be extended to embrace all expense items, controls would also be set over storage as well as handling costs. Individual companies—and hence the entire industry—would profit by the adoption of a technique which industry generally has found to be highly beneficial.

ASHVE Announces Program of Air Conditioning Research

CONTRACTS for cooperative research in fundamental problems of heating, ventilating and air conditioning, have been signed with six colleges and universities, it has been announced by Alfred E. Stacey, Jr., of Syracuse, N. Y., president of the American Society of Heating and Ventilating Engineers. Under the agreement a grant of funds is made by the ASHVE to each institution which in turn utilizes its own laboratory facilities and faculty to perform the research under the direction of a technical advisory committee of the ASHVE.

Both the research programs at the society's own laboratory, located in Cleveland, and at cooperating institutions are supported by an allocation of 40 per cent of the annual membership dues and contributions from industry.

Cooled Space vs. Hot Atmosphere

At the University of Illinois, Dr. Robert W. Keeton, head of the Department of Medicine, will continue studies on whether there is any shock upon human beings entering or leaving a cooled space from a hot and humid atmosphere.

Studies in this field were started at the university 10 years ago, the contract having been renewed annually since then. Dr. Keeton and his colleagues have published several papers on the progress of this research. In their most recent paper, read at the ASHVE's annual meeting this year, it was stated that there is little difference in the way persons with heart disease and those with normal hearts react to sudden change in temperature, no ill effects being observed in either case.

Space and expanded facilities at Kansas State College for the study of heated air jets blown vertically down will be used to seek improvements in industrial ventilation. The study of high velocity air as it is used in factories to provide pure air to men working in areas where fine dust is prevalent, is a vital need of industry. Prof. Linn Helander, head of the Department of Mechanical Engineering, is in charge.

Seek to Eliminate Drafts

Draftless ventilation with both heated and cooled air and the type of outlet form (nozzle, slot grille or perforated panel) needed to achieve it, is the object of the research at Case Institute of Technology, under Prof. G. L. Tuve, head of the Department of Mechanical Engineering. Various air temperatures and velocities will be investigated by Prof. Tuve, who is a past president of the society.

The study of air friction in the various fittings attached to the rectangular ducts which carry air for ventilation purposes, is under the supervision of Lorin G. Miller, dean of engineering at Michigan State College.

Prof. C. O. Mackey, of the Sibley College of Engineering of Cornell University, will continue his studies of the sol-air temperature concept—the combined effects of solar and sky radiation, solar absorptivity, temperature and air movement.

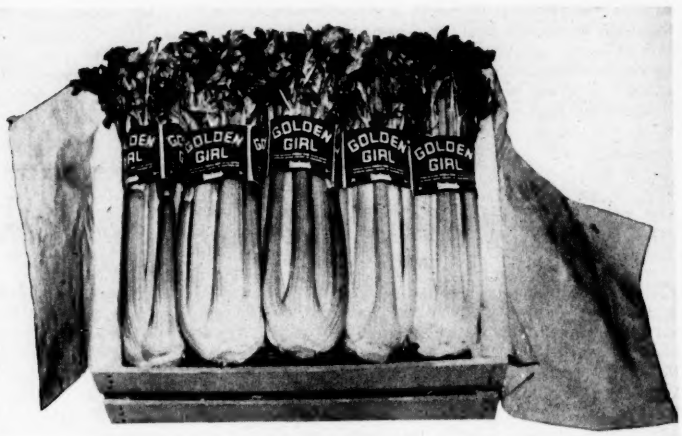
An electrical analogue method is being employed by Prof. Carl F. Kayan, executive officer of the Department of Mechanical Engineering at Columbia University, to continue his investigation on the effect of idle pipes on the temperature field and the heat flow in a concrete slab.

"Serve Celery in Cracked Ice" Producer Advertises on Packaged Celery

A NEW celery package which holds the stalk in shape and clearly displays the packer's brand name has been adopted by Ghiselli Bros., fresh produce packers of San Jose, Calif. The wrap is a three inch wide band called "Benband"* and is produced by the Paterson Pacific Parchment Co. of San Francisco. Ghiselli Bros. packing plant is employing five "Benbander" machines for banding premium celery which carries their Golden Girl brand in two colors, red and white. The label also has upon it the line "Always Serve Celery in Cracked Ice."

can handle one carload (15 tons) of celery in 1½ hours. Two and one-half tons of ice are consumed per car of celery processed. "Stericooling" controls bacterial soft rot and pink rot normally common to most celery growing areas. The process also inhibits the spread of this organism, from one celery stalk to another. Additional advantages are apparent in the freshening action that the ice-chilled solution imparts to each stalk, thereby affording a fresher, more appetizing product in the market.

The "Benbands" permitted the celery "to breathe," so



"Golden Girl" celery, processed and packed by Ghiselli Bros., fresh produce packers of San Jose, Calif. At left is a closeup of a single stalk of celery, "Benbanded" with a special three-inch wrap which includes message "Always Serve Celery in Cracked Ice". Below is a closeup of an open celery crate showing the "Durapak" liner.

The fact that "Benbands" do not become discolored or harmed in water or sterilizing chemical solutions is an important processing advantage. The band, moreover, permits free circulation of cleaning solutions throughout the stalk. This, plus the fact that the "Benband" seal sets at once, makes it possible to crate, lid, label and then subject the product immediately to a cold-bath sterilizing process called "Stericool." This is a patented bacteria inhibiting process of Food Machinery and Chemical Corporation's John Bean Western Division, San Jose, Calif. The packed crates, lined with Paterson's parchmentized cellulose Durapak printed in two colors, are subjected to "Stericooling" for ten minutes.

Washed in Ice Water

During "Stericooling," 2100 gallons per minute of ice cold water, in solution with FMC's "Hypo-Clor" sterilizing material, thoroughly drenches each crate of celery. Processing time, from the time the celery enters the Stericooler until it is discharged, is fifteen minutes. The unit

that the fresh, appetizing appearance of the product contributed to Golden Girl celery bringing top prices in Philadelphia, New York and Chicago markets this year. Celery hearts have not been commercially "Benbanded" at the Ghiselli plant. From the standpoint of "point-of-purchasing" merchandising, the "Benband" wrap affords the consumer an unobstructed view of the packer's brand name. The uniform packages discourage shoppers from tearing down counter displays.

Iceman Speaks at Rotary Luncheon

CHIEF speaker at a Gadsden, Ala. rotary luncheon held early in September was Johnnie Duke, manager of the Southern Ice Co. Mr. Duke showed a picture which portrayed the fact that even with mechanical competition, the ice business is continuing to grow from year to year. The local newspaper reporting this event commented that mechanical refrigeration, instead of killing the ice industry, has caused it to grow and to develop new uses for ice.

* Trade Mark Registered in California.

A portion of the freezing tank space gives some idea of the extent of the plant.

Frozen Food Transportation and Distribution

By A. L. Reneau

Pacific Fruit Express Co., New York City

MUCH has been said and written in connection with the transportation of frozen foods at zero degrees which the frozen food industry generally specifies as being most desirable. Through the medium of various magazines, newspapers and trade literature you have no doubt read about some seemingly marvelous results that have been obtained in cars with various types of mechanical refrigeration systems for this type of traffic, but like the old story of the cook, the proof of the pudding is in the eating, so until such a time as these devices have proved themselves, we in the transportation field are making additional studies to the end that desired results can be accomplished with a minimum of cost to the shipper, consignee and carrier, and with the facilities already available.

As you probably know, construction and insulating of cars has been improved. Overhead brine tank and end bunker cars, all heavily insulated; the latter equipped with fans, have been built specially for this traffic, both of which have proved superior to the conventional reefer. However, the overhead tank type of car presents additional cost due to its type of construction and additional time required for proper icing.

The fan equipped Standard cars were not specifically designed for the carriage of frozen foods, as were the other two, but they did a better job than the standard car without fans, and they have been used in frozen foods traffic with gratifying results. In our new standard fan equipped cars we have 4½ inches of insulation plus reflective material which also have insulating qualities. These cars are also equipped with one-inch side wall flues.

Extract from an address to the National Association of Refrigerated Warehouses, North Atlantic Chapter.

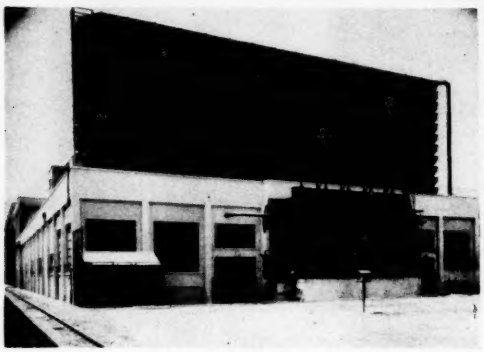
Car Equipped for Dry Ice and Water Ice

During the past two years we have been conducting tests with a heavily insulated car equipped with special designed overhead tanks for dry ice and conventional end bunkers for water ice and salt. This car is also equipped with fans and side wall flues.

One of the new refrigerator cars operated by Pacific Fruit Express.

The underlying principle of this system is to use water ice and salt for car cooling and protection during loading period and dry ice in conjunction with water ice and salt for holding the load in transit. The water ice and salt in this instance acts as a thermostat in controlling the temperature of the air circulated, thereby maintaining a more or less constant load temperature throughout the car with a corresponding constant rate of sublimation of the dry ice. In these tests we have been able to maintain average load temperatures at zero or below, but in doing so we are faced

with a considerably higher cost than the trade can bear. At the present cost of dry ice the total refrigeration charges on a shipment exceed the tariff rate by approximately $250. This cost may be somewhat reduced if and when dry ice is manufactured on a larger scale and made available at more strategic points for the servicing of such shipments. However, we do not believe it will reach a level comparable to present tariff rates.



A large cooling tower extends across one end of the plant. A bank of vertical shell and tube condensers is in the foreground.

Pending the development of more efficient refrigerator cars, there are a number of things that can be done to secure lower transit temperatures. The most obvious one, though possibly not always commercially feasible, would be to provide greater freezer capacity at point of production to insure lower loading temperatures, since the loading temperature of the commodity is perhaps the most important factor in determining its temperature during transit.

In this connection it must be understood we cannot produce a freezing plant on wheels, we can only endeavor to maintain temperatures.

During a period of years in which we have been conducting tests in the transportation of frozen commodities, we have encountered loading temperatures ranging from 4 below zero to 23 above zero, although we will say that the latter condition is an exception rather than a rule. Ordinarily I may say that loading temperatures for these commodities will generally be found in the zero to 10 degree range.

Purpose of Quick Freezing

You all realize the purpose of quick freezing is to preserve almost indefinitely the quality, texture, taste, appearance and health-giving properties of foods at their prime. Cold arrests nature, neither adding to nor subtracting from original values. Heat, on the other hand, forces life but also hastens its destruction, hence brings about undesirable changes. Therefore the quick freezing industry is presented with two main problems. The first problem is the preservation of the pristine qualities of foods, such as aroma, color and flavor, through quick freezing. The second problem and the one that you and ourselves are vitally interested in, is the retention of such prime values as were quick frozen. This retention is accomplished by maintaining already frozen products at virtually unchanged temperatures from the time they were quick frozen to the time they are ready for consumption. It is therefore readily seen that storing, transporting and distributing are items every bit as important as quick freezing.

Even Temperatures Important

The first step, as we see it, in the successful storage of frozen foods is the proper stacking of the commodity in storage rooms to prevent "hot spots" or pockets of hot air, which will defrost and therefore damage the products. Many warehouse people simply cannot grasp the idea of how "hot spots" can develop or exist in a room at zero or below. Even a new or modern warehouse, despite its construction, equipment and machinery has heat leakage, which imperils quick frozen foods. Sources of heat in a room may and do come from walls, air changes, product load or miscellaneous channels. Thickness of insulation and its maintenance checks heat from the walls.

Air changes may result from openings of storage room doors, heat from electric lights, wiring and motors, newly stored products, or from the men working in such rooms. Regardless of the heat sources, it must be minimized because when air temperature in the room goes up, the most available source of refrigeration is the quick frozen food itself. (We do not, however, advocate freezing of help before entering room.) When quick frozen foods are placed against the walls of even a zero temperature room, the heat from such walls is absorbed by the produce since the latter are colder than the walls. The greater the difference between two bodies the more rapid the flow of heat from the warmer to the colder body until their temperatures are equal. The transfer of heat from the higher temperature to the lower temperature body applies with equal force to floors and ceilings.

The icing docks extend along both sides of the plant. This view shows outer track on one side during icing operations.

The problems presented by stationary cold storage are easier to solve than those encountered in mobile refrigeration. The products must not defrost, no matter how long they are in transit. Even partial or "surface thawing" would be detrimental, because slow freezing would follow.

Compactness and lightness, to achieve economy and speed, are general tendencies in American transportation. Quick-frozen foods transportation, however, demands car insulation thick enough to insure minimum temperature fluctuations enroute and yet light enough for economy and speed. Insulation of cold storage room walls average eight inches thick. Such a thickness is impracticable in refriger-

ated cars because of dimensional limitations. For operating and safety reasons cars must be of standard lengths and widths; therefore we are limited in meeting standard methods for storing frozen commodities, that is, 6 inches from the wall. Under our limitations about a one-inch wall flue is all that can be provided.

Handling During Loading

Too much cannot be said about the carelessness some shippers or cold storage plants show in not providing some means to keep warm outside air from entering car during loading. For proper handling, frozen goods should be transferred from the freezer to a cold car through an insulated tunnel, preferably over a conveyor, with a fan set to blow cold air from the freezer through the tunnel. The car door opening should be kept closed with plyboard or canvas fitted around the tunnel opening. Many shippers are careless in this respect and lose a great deal of potential transit refrigeration between the start of loading and the time car doors are closed. In one instance where shipper neglected to provide necessary protection during loading an air temperature of 64 F. was recorded above top of load at bulkhead of car.

For the transportation of frozen products the preparation of the car is important. You are probably familiar with our standard practice for initial icing of cars but I will review this briefly. Initial icing consists of filling bunkers to ¼ of their capacity with 25 to 50 pound pieces of ice, then shatter top pieces to fill in crevices, then apply 10 to 20 pound pieces to bring bunkers up to half tank capacity again shattering to fill crevices. Then supply 50 per cent salt following with 10 to 20 pound pieces of ice to bring bunkers to ¾ capacity; after which another salting of ¼ of the amount to be furnished, then fill bunkers to capacity with 10 to 20 pound pieces of ice and apply balance of salt.

Any salt falling into pans at time of icing should be removed and placed in bunkers, for salt that reaches the ice pan is not only useless but a menace to best refrigerator car performance. Shattering of ice to fill crevices is done to provide a more or less level bed for adding salt and care must be exercised to see that salt does not cascade down between the mesh basket and the bulkhead. When carefully done, icing with 30 per cent salt will give an air temperature, leaving bunker about zero degree. Of course with overhead brine tanks crushed ice should be used with a gradual application of salt as tanks are being filled to assure a good mix.

These methods of icing and salting were arrived at after conducting a series of tests under varied conditions. Incidentally, we do not recommend less than 30 per cent salt for shipments moving during warm weather, and we have found it is never good business to use cars in which old ice remains. We insist always that the old ice be removed and a bunker full of new ice and salt be supplied.

This is very important to you warehousemen as quite often railroads, located in the East and Central West, when called upon to furnish cars for frozen foods loading, make it a point to pick out cars that have just been released from load, the idea being that the shipper would have the benefit of a fully cooled car. This practice would, of course, be all right if the old ice was first removed, but records often reflect that certain of the carriers only supply new water ice and 30 per cent salt, and that quite likely accounts for some of the damage caused, particularly to westbound transcontinental shipments.

It has been our experience in the numerous tests which we have conducted, that at the end of a journey, there is not only an accumulation of salt under the bunkers, but the ice is matted together in such a way as to obstruct air circulation. It is most difficult to overcome these conditions through the barring down of the old ice as the bunkers are usually pretty well filled, and it is hard to break down the ice that is bridged near the base of the bunkers. This makes it impossible to get a thorough mixture of ice and salt throughout the bunkers, which is necessary if low temperatures are to be maintained.

Claims on frosted foods have become quite a problem to many of the carriers and, of course, damaged shipments are something which all of us desire to overcome; therefore, this hazardous practice should be discontinued and ice removed from all cars used in transcontinental service before being placed for another load. This we call normalizing. Generally cars are initially iced 24 to 36 hours before loading and in some cases reiced before being switched to loading point.

In tests we have found that when a heavily insulated car was initially iced with 30 per cent salt, the air inside the car and the inside car structure reached a minimum temperature in 24 hours, and that during the longer cooling periods with one interim reicing, temperatures within car were lowered from nothing to two degrees. Many times it is important to have the first reicing immediately after loading. When reicing is done before loading much of the refrigeration from the reicing is lost through the doors when they have to be opened for loading.

So much for preparation and transportation and that brings us to a very important factor which should also interest you warehousemen, namely, Carelessness at Terminal.

Carelessness at the Terminal

Food technologists contend that quality in some frozen foods is adversely affected through water-vapor transfer and re-crystallization of ice when commodity temperatures fluctuate. Much of this damage could be and probably has been done at terminals after frozen foods have been transported across the country with great care. We have record of a test car standing on track several days awaiting unloading, with commodity temperatures steadily climbing above 20 F. Car doors were then opened to summer weather. Dollies of frozen peas have been left exposed for an hour or so, awaiting the availability of a warehouse elevator. In an extreme case, one test car was unloaded at Jersey City directly to trucks, when outside air temperatures were 90 F. Loaded trucks were then left standing under a summer sun for as long as three hours before being driven to a distant freezer. During all this procedure no one representing the ownership of the foods seemed to be present or to have any interest in what transpired. To all appearances the goods might have required no more attention from the owner than the average shipment of potatoes.

The long distance transportation of frozen goods is not accomplished until they are placed in the hands of the consumer. Deterioration in quality can take place between the time of the initial freezing process and loading into the refrigerator car, during transit, or it may take place between the refriegrator car and the consumer's door. To purvey foods of the finest quality, all concerned must see to it that there is no lapse in vigilance at any step in the necessarily refrigerated journey.

Icing Facilities

While we depended almost entirely on commercial ice companies in the early years, we now own 17 ice manufacturing plants, with a combined manufacturing capacity of 5545 tons daily, and storage capacity of 304,570 tons. In addition we have two natural ice plants with storage capacity of 99,200 tons. Altogether, we produce about 1,250,000 tons annually. We own 51 icing platforms and car

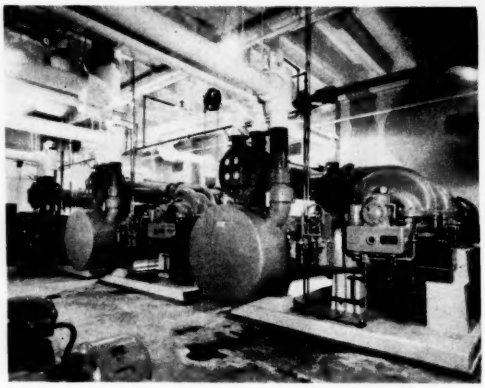
(Continued on page 53)

Twin-Duct Air Distribution System Provides Flexible Air Conditioning for New Building

A HUGE 900 h.p. year-around air conditioning system, installed by W. S. Kilpatrick & Co., heating and air conditioning contractors, so flexible in design that a different degree of heat or cold can be provided every 14 feet throughout the entire 500,000 sq. ft. structure, is a feature of the new 13-story headquarters building of General Petroleum Corp. in Los Angeles, Calif.

Basis of this flexibility is the twin-duct air distribution system which makes it possible to supply both heated and cooled air simultaneously to the same or adjacent portions of the building, should the need arise. The separate ducts supplying the heated and cooled air join as they enter each air outlet.

These outlets are spaced to fit the modular design of the building which is on a 14 and 7 foot plan. Outlets are located each 14 feet (as indicated by the outside walls) on most floors of the building. A few floors, where smaller offices may be used, contain outlets every 7 feet. Each outlet has its own thermostatic control, more than a thousand controls altogether. Since most offices are 14 feet in width, that means each office can choose its own weather.

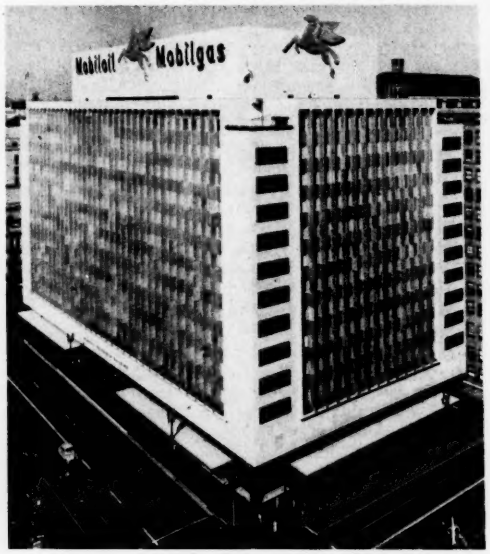


Centrifugal compressors, chillers and condensers, part of air conditioning installation in new General Petroleum Corp. building, Los Angeles, Calif.

Where offices are larger, one control can be linked to several outlets, the extra control position simply being blanked off. The design of the building includes movable steel interior walls for maximum flexibility and the air conditioning matches this flexibility in every respect. The controls operate dampers which automatically mix the hot and cold air to provide the desired temperature. A minimum of six and an average of eight complete air changes hourly are provided.

Fan Rooms

Feeding the air to the twin-duct system are 48 fan rooms which aid in providing the "zoned" control. Four are located on each floor from the second to the top floor of the 13-story building. Each fan room contains heating and cooling coils and a 3 hp. electrically driven fan delivering 7500 cu. ft. of air per minute. The fan draws about



The new General Petroleum Corp. building, Los Angeles, Calif.

25 per cent outside air to mix with about 75 per cent return air which has been passed through a second filter and past a bank of sterilizing lamps.

The sterilizing lamps and additional duct filters, which process both outside and re-used air, will, it is hoped, reduce the transmission of colds and other diseases, as well as keeping the building interior free of expensive and damaging dust.

The coils for hot and cold air are located in separate chambers and the hot coil chamber is automatically controlled at a level required by the heating load, which enables the system to provide a higher delivered air temperature during warm-up periods and periods of extreme heat demand. All fan rooms are controlled by a single panel located in the basement. Red lights show instantly which of the 48 rooms are in operation.

A high degree of economy is expected from the zonal system from the stand-point of building operations. Approximately 20 rooms are served by each fan room, and each fan room can operate independently of all the others. Hence, when small portions of the building are in use at night and on week ends and holidays, the effective air conditioning of the used areas can be accomplished without heating or cooling the entire building.

In the design of the fan rooms, particular attention was paid to compactness of design to keep usable office space to a maximum. Consequently, each room contains only about 225 sq. ft. although complete accessibility of all equipment was achieved.

Additional attention in design was given to the ducts themselves to keep the double duct system from taking up too much overhead space. The ducts were designed

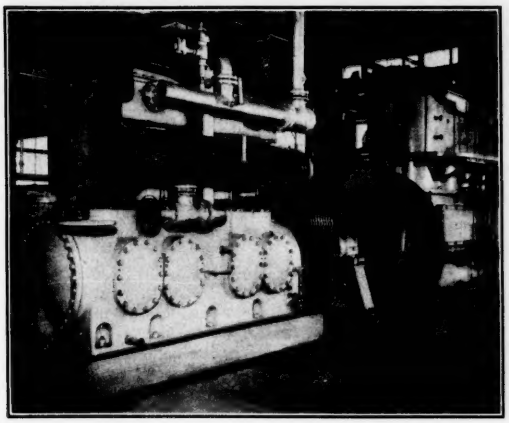
(Continued on page 53)

Refrigerating "The World's Biggest Vegetable Patch"

Fred H. Vahlsing whose company is America's largest grower and shipper of produce.

EVER since Coronet Magazine published the article entitled "The World's Biggest Vegetable Patch," and this was condensed by the Readers Digest, some two years ago, the region around the Lower Rio Grande has become famous as a magic valley.

The area extends west from Port Isabel to Mission, Texas, a distance of some 80 miles, and northward to Raymondville. This region now includes about 200,000 people, living in 42 suburban-type cities and towns, the largest of which are Brownsville, Harlingen and McAllen. Across the river are the Mexican towns of Matamoros and Reynosa, with a total population of nearly 30,000. There are an estimated 25,000 transient Mexican laborers and families.



Four-cylinder 14 in. by 12 in. Frick compressor driven by 425-hp. Bruce-Macbeth natural gas engine, at the Edinburg Ice and Cold Storage Co. plant.

Rich soil, warm winters, plenty of irrigation and American enterprise, have made a garden spot out of what was waste land a few years ago. Today, some crop is being harvested every month of the year from the half-million acres of irrigated delta. Citrus fruits, early vegetables and cotton are the chief products. There are said to be 10 million citrus trees. Publicly owned water districts provide irrigation at a cost of from $4.00 to $5.00 per acre annually.

Both the Southern Pacific and the Missouri Pacific Railroads serve the area, which naturally enjoys good water transportation.

Ice Making Plants

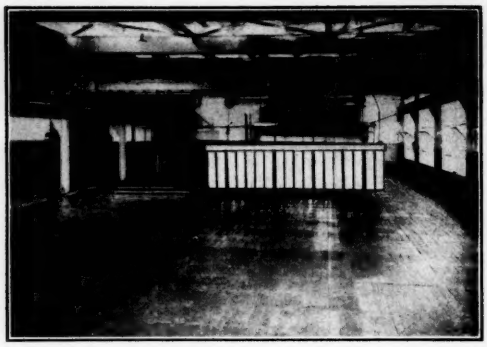
For handling the vast shipments of citrus fruit and early produce, including 60 per cent of all the grapefruit produced into the United States, refrigeration in large amounts is of course required. Important ice-making plants have been erected in the last two or three years at Raymondville, Edinburg and Matamoros. A huge quick-freezing plant is in operation at Brownsville.

Map showing location of important ice and refrigerating installations in the Magic Valley.

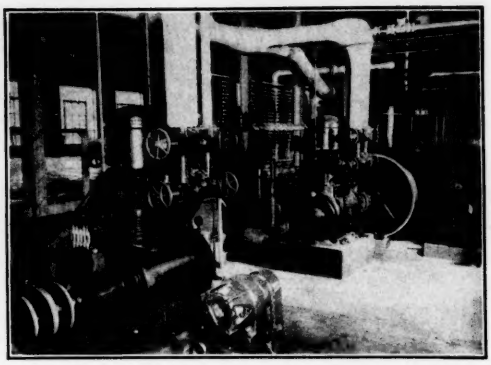
The plant of the Pan Am Freezers Ltd., at Brownsville, Texas measures 100 by 200 feet and has a single span roof.

Raymondville

The Independent Ice Company plant at Raymondville was built in 1946 by A. D. and D. N. Jones. This plant produces 110 tons of ice per day, which is harvested by grids holding twelve 300-lb. cans at a time. Clear ice is made with the Frick Pendulum System. The ice tank is long and narrow. Two 11 by 10 enclosed ammonia compressors, driven by direct-connected natural gas engines of 200 hp. each, carry the cooling load. A generator of 50 kw. is driven by V-belts from the flywheel of each engine.



These two tanks at Edinburg, Texas, make 300 tons or more of ice per day.



Pair of 11 by 10 in. compressors, with 200-hp. engines, at the Independent Ice Company plant, Raymondville, Texas.

Edinburg

Edinburg Ice & Cold Storage Co. is owned by Fred H. Vahlsing, who has probably done more than any other one man to develop the Lower Rio Grande Valley. This plant has two tanks making a total of 300 tons per day. Eighteen cans are harvested at a time. The ice is white, and is all used for shipping purposes, in railroad cars and trucks.

Running 11 months per year, this plant turns out approximately 100,000 tons of ice. Two-thirds of this amount is used on vegetables grown by H. T. Vahlsing, Inc., America's largest growers and shippers, and the other third in icing car bunkers. The bunker icing service is rendered to the Southern Pacific Railroad. During the height of the shipping season from January to May, there are times when over 500 tons of ice are drawn from the storage daily.

The Frick 4-cylinder compressor, with a bore of 14 inches and a stroke of 12, is driven by a Bruce-Macbeth gas engine of 425 hp. There is storage for holding 18,000 tons of ice and complete facilities for icing up to 80 cars at a time. Also two 12-in. by 12-in. two-cylinder compressors driven by 165 hp. natural gas engines. Gas power is said to cost 13 cents per ton of ice. Manager of this plant is A. M. Casberg, 1948 president of the National Association Practical Refrigerating Engineers.

Brownsville

The Pan Am Freezers, Ltd. employ from 400 to 700 workers in its plant at Brownsville. This has two quick-freezing tunnels, each 70 ft. long and 15 ft. wide. Each tunnel accommodates 40 shelf or push trucks. The cooling coils are kept at minus 45 F. Among the many products frozen are crushed pineapples and other fruits, vegetables, poultry and seafood. This plant has a 4-cylinder 15 by 10 compressor, serving as a booster, and an 11 by 10 for the second stage; a 7 by 7 holds the freezer storage room at minus 5 F. This storage measures 24 ft. by 100 ft. by 10 ft. high, and is insulated with 6 in. of Armstrong corkboard.

Matamoros

Fabrica de Hielo Matamoros produces 40 tons daily of clear ice, made in 480 cans of 300-lb. size. Ice is harvested in grids holding four cans each, and equipped for use with the F-P-R air agitating system. The cans, as in the other plants mentioned, are of the Knickerbocker all-welded type. An 8 by 8 compressor is operated in parallel with a 7 by 7, these being equipped with V-belt drives from motors of 75 and 50 hp. respectively. The plant uses Jamison cold storage doors and Mundet insulation.

Grocery Chains Pay Premium for Ice Processed Sweet Corn

THE process of preserving sweet corn, by keeping it iced from the time it is picked until it is sold, is being used with great success by 12 growers in the Horseshoe Lake area near Granite City, Ill., Truman W. May, Madison county farm advisor, announced.

The undertaking, expected to expand next year, is known as the St. Louis Area Corn-Marketing Project.

The process, which requires quantities of crushed ice, was started in July 1948 at the suggestion of Robert T. Thornburg of Moberly, Mo., then representing a grocery chain and now Missouri Director of Agriculture.

Two grocery chains are buying all the quality corn the farmers can deliver, paying prices as high as twice those paid for unselected ears not so treated, May said.

Managers of Granite City chain stores taking part in the project make telephone calls to the farmers, giving the number of ears wanted for the next day.

Ears are picked as early in the morning as possible, never later than 10 o'clock. Corn is taken at once to shade and packed in sacks, five dozen ears to a sack. The farmers promptly load the sacks in a tight-box truck, spreading crushed ice over each layer of sacks.

Temperature at loading time determines the amount of ice needed, the average being about 500 pounds of ice to each 100 sacks. A tarpaulin is spread on top to keep air from reaching the ice.

Some deliveries are made directly to retail food stores, others to freight cars for distant shipment. In either case, the corn is kept under refrigeration until sold to the consumer.

This year's sweet corn crop in the St. Louis area is bigger and better than last year's, May said, with a much lighter infestation of ear worms. As a result, he continued, corn on the regular wholesale market has dropped as low as 10 cents a dozen, but a premium price as high as 20 cents a dozen has been paid for the ice-processed corn.

The Ice Industry

National Association of Ice Industries

Executive Offices
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PRESIDENT
M. J. Garvey, St. Joseph, Mo.

EXECUTIVE SECRETARY
Mount Taylor, Washington, D. C.

1949 Ice Convention Preview—

Ice Company Executives and Outside Speakers Will "Turn Spotlight of Analysis on Ice Business"

ALTHOUGH names of principal speakers cannot be divulged as yet, Mount Taylor, Executive Secretary of the National Association of Ice Industries, says that the majority of talks to be given at the Annual Ice Convention November 15 to 18 at the Hotel Commodore, New York City, will be given by "experienced, level-headed, realistic ice company executives."

There will be only one or two exceptions to this policy, according to Mr. Taylor, and these speakers will be from outside the ice industry. They will discuss the broad, general economic and business conditions of the country today.

Every session will be brief with none lasting more than three hours. The entire program will be carried out in high gear with every effort of the program committee pointed toward a policy of never a dull moment. There will be plenty of surprises and, although there will be several early bird attendance awards, it seems unlikely that such measures will be necessary to keep the convention hall jam-packed at every meeting.

In keeping with the theme of the Convention, "Turning the Spotlight of Unbiased Analysis on Our Ice Business," routine reports will be kept to a minimum and no staff member of the National Association will take part in the oral presentation of the program agenda.

A hint of the "fireworks" to be expected by all who come to the Commodore Hotel in New York City during the convention is revealed in the title of the opening address to be given by a prominent member of the industry. It is called "Shoot the Works!" The contents of this rousing speech cannot be revealed now because the surprise element would be lost.

This address will be followed by a short welcoming speech, and a brief memorial service for deceased members. Then four speakers will round out the first day's program. Subjects of three of the talks will deal with our business responsibilities, turning the spotlight of unbiased analysis on the ice business and, if present plans jell, a keynote address —by a nationally prominent personality—on business problems industry has to face in 1950. Before looking forward to the expected future accomplishments of the Ice Industry, President Mike Garvey will report on the 1949 progress of the Association.

The second day's program calls for a down-to-earth, brass tacks discussion of what the iceman can do to hold his present business gains and open new fields for increased tonnage sales. There will be a discussion of several factors involved in profitable use of vending stations—selection of locations, servicing, and economy of upkeep. The packaging of processed ice for customer acceptance will be covered by another speaker. This is to be followed by talks on new fields in which greatest opportunities exist for expansion of ice consumption and sales. Precooling and icing of produce, processing and handling of poultry, and the sale of auxiliary ice to mechanical owners are to be covered by progressive icemen and a leading spokesman from some other industry.

After the nomination committee gives a short report, the third day's session will be launched with an outline of the vitally interesting provisions of present Federal Law affecting ice company operations—Wage-Hour, Social Security, and Withholding Taxes. The remainder of that day's program is to be devoted to the Public Relations Department's 1949 activities and plans for the coming year. Since 1950 marks the 100th Anniversary of the manufactured ice business, some startling events can be expected during this session. Tentative plans call for the crowning of a beautiful girl as the Centennial Ice Queen by way of launching the Ice Industry's 100th year. Icemen will get their first glimpse of the 1950 advertising program.

An experienced iceman will spark the final session on Friday with a talk that will make everyone who attends sit up and take notice of his business. He will face the hard facts of what the Ice Industry must do to better serve ice customers.

How to cut costs profitably, a discussion of the need for training junior executives, and an analysis of sound relationships of cost and price structures will precede the report of the Board of Directors. The final speech will be made by an Association member of long standing who is noted for his sincerity and good humor as well as his progress in the ice industry. His topic will cover basic conditions in the industry. "It's Your Industry, Your Association, and Your Program" is the subject of his talk, one that no one will want to miss.

Plans are well formulated now for the entire program; yet, there are bound to be changes by the time November rolls around. Speakers will be revealed at a later date, when all acceptances have been received by the program committee.

Entertainment

The Convention Entertainment Committee promises a show on Thursday evening immediately following the annual banquet that should top all previous efforts along this line. Since there will be just one night of fun and frolic, the outstanding talent of New York City will be on hand. Dancing will follow the show. Dress is optional.

A spokesman for the convention committee suggests that all who are planning to come to New York should make early reservations. All indications point to one of the best attended Ice Industry Conventions in many a year.

Research Department Announces New Plan of Publicity

THE Research and Engineering Department of the National Association of Ice Industries has issued a bulletin outlining a new procedure by which there will be more publicity on the research projects underway. In the past, the bulletin explains most of these reports to members have been made at the time a project had been finished. This was necessary because much of the work consisted of studies in the various colleges and universities. This phase of the program is being continued but at the same time more attention is being devoted to industrial projects. Consequently during the next year more information will be issued on the planning and the progress of the work. Too many details will not be given, there is not time for that, but topics on which all industry members can work together will be published.

It is quite possible, the bulletin states, that others may be thinking about, perhaps even working on, some of these problems. Those who are doing something on the projects mentioned or any other project are asked to write the department about it. If they are exploring an idea which is not at present in the program, the department director would like to know about it. It may be possible that other members of the industry are working on it too. An exchange of ideas will be extremely helpful.

The Research Committee has been giving considerable thought to the bagging and handling of processed ice within the plant. As ice companies go more and more into the sale of crushed ice, sized ice, and cubes, need for study and revision of handling methods becomes most important. Attention will have to be given to integrating the crushing, sizing, bagging, movement, storing, and loading operations in order to make more efficient use of labor, equipment, and facilities. The committee feels that over the next few years much attention should be given to this phase of plant operation. Some equipment is being offered, other machines are being developed, and still others will have to be adapted to this use. This development within the industry is something on which many can contribute—and benefit.

Many icemen over the country have indicated their interest in and need for an ice refrigerated bottle beverage vending machine. Such a unit is now being built, of the roulette type. Details are available from the Research and Engineering Department.

Ice Plant Sets Safety Record

THE Crystal Ice & Cold Storage Co., Phoenix, Ariz., finished the cantaloupe season this year with the best safety record in the history of the company. Employees worked a total of 82,829 man hours during July with only two accidents, one in car icing and one in plant labor.

Big Ice Companies Pledge Support of 1950 Ice Promotion Program

SIX of the largest ice companies have gone on record as pledging their full support to the 100th anniversary Ice Promotion Program in 1950 and have invited all other ice companies to join with them as advance subscribers to this program. The announcement and invitation are stated in the following letter, signed by the American Service Co., New York; City Products Corp., Chicago; Southland Corp., Dallas, Tex.; Atlantic Co., Atlanta, Ga.; Railways Ice Co., Chicago; and Union Ice Co., San Francisco.

Dear Fellow Iceman:

We are vitally interested in maintaining the enviable position which the ice industry now enjoys nationally as an essential and highly respected industry. Such position is in large measure the result of the continuing program of public relations which the ice industry has conducted over the past fourteen years.

Next year will mark the 100th anniversary of the manufactured ice business. Because of this fact, it is doubly important that our public relations program not only be continued but, if possible, expanded so as to capitalize to the fullest on the advertising and news possibilities inherent in our observance of the golden anniversary of the ice business.

We are very fortunate in that we have a "good press." Magazine, radio, and newspaper editors alike have been most generous in the editorial and news space accorded the ice industry. Such "good press" is not a "happen-so." It is the cumulative dividend earned on the $5,000,000 that has been invested in our public relations program to date.

The "good press" that is ours can help to make the year 1950 a memorable one in the history of the ice industry if we all pool our efforts toward underwriting the cost of an adequate public relations program.

At a recent meeting in Chicago, we pledged our support to the 100th anniversary ice promotion program as follows:

1—By signed subscription cards calling for the payment of 3c per ton on all ice sold by our companies during the calendar year 1948, including that sold for car icing.

2—By pledging our assistance, plus the assistance of our associates, in giving the time necessary to help conduct a personal company-by-company solicitation.

Between now and the time for the personal solicitation we want to give you, a consistent and loyal supporter of all cooperative activities within the ice industry, an opportunity to join us as an advance subscriber to the 100th anniversary ice promotion program. A subscription card is enclosed for your convenience.

All subscriptions postmarked before midnight of September 15 will be placed on the honor roll of advanced subscribers to the 100th anniversary ice promotion program and will be accorded special recognition.

The public relations program of the ice industry can be likened to a lighthouse with its bright light shining forth to advertise this great industry of ours. We must not let the light go out, lest our ship crash against the rocks. Your subscription, when added to ours, will help to keep the light shining brightly throughout 1950.

Don't delay! . . . Sign your subscription card now! . . . Return it promptly! . . . Get your name on the honor roll of advance subscribers to the 100th anniversary ice promotion program! . . . 3¢ per ton on 1948 tonnage is a small price for your part in helping to keep the light shining! . . . Let's make the 100th anniversary of the ice business a real celebration in every sense of the word!

New Wage Hour Law Passed by Senate—Administrator Announces Revision of "White Collar" Exemptions

A BULLETIN issued by the National Association of Ice Industries announces that a new Wage-Hour Law, to be known as the Fair Labor Standards Act of 1949, moved closer to final enactment when the Senate, on Wednesday, August 31, passed S-653, as reported by the Senate Labor Committee, after amending it on the floor in a few particulars.

Features Affecting Ice Industry

For the ice industry, the following are the important features of the Senate bill as passed:

1. The minimum is raised from 40 cents to 75 cents.

2. The Child Labor provision of the existing Act is strengthened by outlawing the employment of any employee under the age of sixteen engaged in commerce or in the production of goods for commerce.

3. The Administrator is given authority to bring suits against employers to collect and supervise payments of alleged wages owed employees.

4. The "retail or service establishment" exemption was expanded through the adoption of the George Amendment which reads as follows:

"Section 13 (a) of such act is further amended by inserting the following after clause (3) thereof: 'or (4) any employee employed by an establishment which qualifies as a retail establishment under paragraph (2) of this subsection and is recognized as a retail establishment in the particular industry notwithstanding that such establishment makes or processes the goods that it sells: Provided, that more than 85 percent of such establishment's annual dollar volume of sales of goods or services is made within the State in which the establishment is located'."

The language of the George Amendment was modified in the closing minutes, just prior to final vote by adding the "provided" clause.

This change was necessary in order to get the Senate to accept the Amendment. The adding of this clause creates a difference in language between the Senate bill and the House bill as passed August 11 (Lucas Bill), and thereby makes it necessary for the two versions to go to conference incident to working out some kind of compromise.

With the exception of the objectionable 75 cents minimum, contained in both bills, the House bill is considered far more acceptable to industry than the Senate bill, in that it provides exemptions for a greater number of employees and denies the right of the Administrator to bring suit against employers. However, present indications point in favor of final adoption of the Senate bill.

Regarding ice industry exemptions, the Bulletin states that the Association plans to do everything possible to preserve it, even if it has to accept the Senate version. A recent bulletin, reviewed in ICE AND REFRIGERATION, explains its need and meaning. Based on comments, there seems to be some misconception within the industry as to its merits and/or possible benefits. Regarding this, all ice companies may rest assured that:

1—If they are now legally exempt from the present Act, they will in no way be brought under the new Act by virtue of the new 13 (a) (4) clause.

2—Many ice plant establishments now denied exemption because of their production (manufacturing) activities will be able to qualify as "retail establishments" and thereby will be completely exempted for the law notwithstanding they make or process the goods they sell.

Administrator Announces Revisions of "White Collar" Exemptions

A late news release has been issued by Wm. R. McComb, Administrator of the U. S. Dept. of Labor's Wage and Hour Public Contracts Division announcing revisions he proposes to adopt in regulations governing exemption of certain so-called "white collar" employees from the minimum wage and overtime pay provisions of the new Wage-Hour law.

Last substantially revised in 1940, the regulations affect some 2,500,000 employees. They contain "tests" of duties, responsibilities, salary levels, and other basic requirements for employers to apply in determining which of their employees may be exempt from the wage and hour provisions of the law as an "executive", "administrative", "professional", "local retailing", or "outside salesman" type of employee.

The proposed revisions clarify the duty requirements of the regulations for the five types of employees involved, and change the salary necessary for exemption of "executive" type employees from $30 to $55 a week, and for "administrative" and "professional" type employees from $200 a month to $75 a week. A new provision would shorten the exemption test for salaried employees of these three types who receive at least $100 a week.

McComb said the proposed revisions would not materially change the number of "white collar" employees affected, but would clarify application of the regulations to such employees, thus reducing the risk of unwitting violations through improper classification of exempt and nonexempt employees.

Basic Requirements for Exemption

Among the basic requirements for exemption under the proposed regulations are: (1) "executive" employees must perform managerial duties; (2) "administrative" employees must perform office or nonmanual field work of substantial importance in the management or operation of the business; (3) "professional" employees must perform work requiring advanced knowledge in a field of science or learning or perform creative work in an artistic field; (4) "local retailing" employees must make retail sales mostly interested in nature; (5) "outside salesmen" must be engaged to sell, away from their employer's place of business.

Text of the proposed changes in the regulations (Part 541 of the Code of Federal Regulations) appear in the Federal Register September 10, together with notice of opportunity to submit written comments within 30 days.

Final action will be announced by the Administrator sometime after expiration of the 30-day period.

McComb's proposed revisions are based on a detailed Report and Recommendations submitted to him by Harry Weiss, a Branch Director of the Divisions, who served as Presiding Officer during the 22-day session of a public hearing, ending in January 1948, on proposals to amend the regulations. More than 100 witnesses, principally representatives of management and labor, appeared at the hearing, and approximately 200 briefs and exhibits were filed before, during and following the hearing.

The Weiss Report and Recommendations, which includes interpretations of some of the terms in the proposed regulations, also was made public. Major changes in the proposed revisions are:

"Executive" type of exemption

1—Employee must receive salary of at least $55 a week. (The present salary requirement is $30 a week.)

2—Employee's nonexempt work—activities not "directly and closely related" to his executive functions—must not exceed 20 per cent of his own weekly hours worked. (At present, the regulations describe nonexempt work as work performed by nonexempt employees generally and limit nonexempt work of "executive employee" to 20 per cent of weekly hours worked by nonexempt employees under his supervision.)

3—Employee who receives salary of at least $100 a week could be exempt on the basis of a shortened test. (At present, the regulations do not provide a shortened test for exemption of higher-salaried employees.)

"Administrative" type of exemption

1—Employee must receive salary, or fees, at rate of at least $75 a week. (The present requirement is $200 a month.)

2—Employee's primary duty must consist of the performance of office or nonmanual field work directly related to management policies or general business operations of his employer or his employer's customers, and his nonexempt work—activities not "directly and closely related" to his administrative duties—is limited to 20 per cent of his weekly hours worked. (At present, the regulations do not clearly specify a primary duty test for "administrative" employees and contain no provision permiting performance of nonexempt work.)

3—Employee who receives salary, or fees, at rate of $100 or more a week could be exempt on basis of a shortened test. (At persent, the regulations do not provide any shortened test for exemption of higher-salaried employees.)

"Professional" type of exemption

1—Employee must receive salary, or fees, at rate of at least $75 a week. (The present requirement is $200 a month.)

2—Employee must have as his primary duty (a) work requiring knowledge of advanced type in a field of science or learning, *or* (b) must perform original and creative work in an artistic field, and his nonexempt work—activities not "an essential part of and necessarily incident" to his professional duties—is limited to 20 per cent of *his* own weekly hours worked. (Now, the regulations do not clearly specify a primary duty test for "professional" employees and limit their nonexempt work to 20 per cent of weekly hours worked by nonexempt employees.)

3—Employee who receives salary, or fees, at rate of $100 or more a week could be exempt on basis of shortened test. (At present, the regulations do not provide any shortened test for exemption of higher-salaried employees.)

(No changes are proposed in the salary requirements now in effect in the regulations for employees in Puerto Rico and the Virgin Islands.)

"Local Retailing" and "Outside Salesman"

As at present, there would be no salary requirement for these types of employees.

"Outside salesman" employee's duties would be expanded to include obtaining orders or contracts for *services*, as well as for the use of facilities.

For both types of employees, nonexempt work would continue to be limited to 20 per cent of weekly hours worked by nonexempt employees of the employer.

Ice Public Relations Today

A NEW publication "Ice Public Relations Today" has been started by the Public Relations Department of the National Association of Ice Industries, taking the place of "Here's How."

As the name implies, it is designed to keep ice distributors informed as to what the Public Relations Department of the National Association of Ice Industries is doing. It will show how public relations, publicity and advertising are working to increase the sale of ice. It will also show how other ice companies are tying-in on the local level with the national public relations campaign. Local ice companies very often run a publicity, advertising and public relations program which satisfies the needs of their particular area. Whatever success they have will be publicized so that other companies may benefit by their activities.

Every means available will be utilized to keep this new service a vital and interesting publication. Primarily, it will give information that will help local ice companies understand the national public relations program and capitalize on it.

Issued in a new and attractive format and edited in a readable and up-to-date style, it should be interesting to all members of the industry.

Research at Purdue University Provides Selling Aids

A FEATURE story in the May issue of the Indiana Food Merchant, publication of the Indiana Retail Grocers and Meat Dealers Association, describes studies made at Purdue University, Lafayette, Ind., on the use of ice for preserving fresh produce in retail markets. The studies and the resulting article were made possible by a project sponsored at the University by the Indiana and the National Associations of Ice Industries.

The article was written by Eric C. Oesterle who conducted the study of retail methods of displaying vegetables. Mr. Oesterle is now engaged in touring the State of Indiana with a mobile trailer classroom-laboratory holding schools for the purpose of training produce people in handling, displaying and merchandising of fresh vegetables. The activity is sponsored by Purdue and the Retail Grocer's Association. It is to be continued for two years. It is beamed at grocers and has sales appeal. It was written in their language and it emphasizes selling arguments which they appreciate and understand. Copies were supplied to a number of ice men by the National Association.

Research on Icing Sweet Corn

A STUDY of the effect of field icing of sweet corn is being made at Purdue University, Lafayette, Ind., in cooperation with the Indiana Association of Ice Industries. Joe Vandemark of the University has been appointed to this work and he plans to conduct tests in a number of sections of the state which are to include Princeton, Brownstown, Marion County and Auburn.

This work will be educational, designed to show growers in Indiana how they stand to profit by icing their sweet corn in the marketing process. The Indiana Association is cooperating with Purdue to the extent of furnishing the equipment to do the job of icing and also a quantity of ice for research purposes. A full report of this study will be made available to the members of the Association for their use in cooperating with local growers of sweet corn.

Industrial Conference Discusses Need for Employee Training

INDUSTRY must take steps now to operate efficiently in the current buyer's market. The training of supervisory management in salesmanship and personnel administration is vital to the success of any business, according to John B. Pope, Specialist in Adult Education of the U. S. Office of Education. To acquaint other industry executives with what can be done on a nation-wide scale in the field of supervisory training, Mr. Pope called a conference September 2 of national business leaders to see and learn how the National Ice Marketing Institute carries out a course of concentrated study for ice company executives.

The School was founded in 1948 by the Personnel Training and Marketing Department of the National Association of Ice Industries, to enable management personnel to expand their facilities with the aid of experienced instructors and discussion leaders. The ice industry felt a need after the war years to revive better methods of merchandising and qualities of leadership in the handling of people. Because of the outstanding way the ice industry had accomplished this end, Mr. Pope felt that other industries could profit by visiting the School and learning how it functions.

Executives came from National Trade Associations of such industries as hotel, food chains, coal, paint, fresh produce, cleaning and dyeing, carbonated beverages, milk, lumber, confectioners, restaurant; along with the American Dental Trade Association and the American Retail Federation. Mr. Pope invited several other guests to attend the conference. Among these were a professor of economics, a representative from the Department of Commerce, and executives from the Trade Association Department of the U. S. Chamber of Commerce.

Training in Ice Industry

Daniel A. Prager, Director of the Personnel Training and Marketing Department of the Ice Association, discussed the problem of supervisory training in the Ice Industry. He explained why and how the National Ice Marketing Institute was organized, that it is approved for veteran training under the G. I. Bill of Rights, and that the course is open to company heads, sales managers, personnel directors, superintendents, office managers, and all management personnel interested in expanding markets for ice. He said that a maximum of twenty students are accepted for each class, and that the school is open to both sexes. He reported that last year icemen from 36 states and Canada were represented among enrollees in the Institute, and he presented several testimonial statements from both employers and graduates, pointing out that investment in this training had been a very wise outlay.

Thomas W. Douglas, Superintendent of the Institute, followed Mr. Prager's discussion with an explanation of course procedure. He pointed out that typical problems are presented and class members demonstrate how they would handle such problems. For example, such situations as handling an employee grievance, customer complaint, the interviewing of an applicant for a job, are created. The student then shows how he would handle each problem. A wire recorder picks up the conversation which is played back afterward during a class critique.

Mr. Douglas made particular note that practically all who attended the conference were from industries which depended upon the small retail outlet for the bulk of their sales. This method of reaching the consumer creates a never-ending problem of supervisory training in sales and merchandising. The newer and more aggressive selling methods must be imbued in the lower echelon as well as top-level employees if business is to survive in present day competition, declared Mr. Douglas. In a round-table discussion which followed, the costs of maintaining the school were thoroughly analyzed.

John P. Gray of the National Institute of Cleaning and Dyeing reported that only this year has his school instituted a course in management training. For almost 22 years it has been devoted strictly to technical subjects.

During the discussion it was emphasized that one of the most difficult tasks in initiating any type of industrial school is the job of selling top management on its importance and urgent need. Each industry leader seemed to have a separate problem peculiar to his own business; nevertheless, it was the general consensus of all present that the visit to the National Ice Marketing Institute classroom gave them concrete evidence of what could be accomplished.

Toward the end of the session, the ice industry's film, "Naturally Yours," was presented after introductory remarks were made by Guy W. Jacobs, Director of the Public Relations Department.

Beverage Industry Magazine Tells Story of Ice

IN THE August issue of "The Crown," a company publication issued by the Crown Cork and Seal Co. of Baltimore, Md., Miss Roberta Johns of the Public Relations staff of the National Association of Ice Industries has a three-page illustrated article on the ice industry.

Carrying the title "The Ice Man—He Stills Comes", the article tells about the progress made by the ice industry during recent years from the results of research. Because of the need for refrigeration during World War II came the realization to ice industry scientists and engineers that a real contribution could be made by them to the war effort. As a result of this research program, the ice industry was recognized as one of the relatively few industries critically essential to the welfare of the nation and the conduct of war. And today the ice manufacturing business is an important industry in the economic structure of the country, employing more than 210,000 men and women during the summer months with an annual payroll in excess of 2 million dollars and a capital investment adding up to 664 million dollars.

The article is illustrated with a portrait of a modern ice delivery man and pictures of the interior of an ice storage room, platform of an ice company, a clear ice cube compared with a cloudy cube made in a mechanical refrigerator and historical pictures of natural ice harvesting.

Trapped by Ice Men Burn to Death

TWO men were burned to death when they were trapped in a blazing truck cab by a load of ice at Clarksdale, Miss. They were identified by police as J. D. Stewart, employee of a Cleveland, Miss., trucking company and Willie Wagner, driver of the truck. The large transport truck carrying the load of ice from Memphis to Cleveland suddenly left the road, overturned, and burst into flames. The ice load shifted forward at the impact and both were pinned in the cab.

Employers' Insurance Association Analyzes Ice Accidents

TO OBTAIN a cross-section of typical ice industry accidents and their causes and costs, the Texas Employer's Insurance Association made a thorough analysis of 1,138 actual ice accidents. Excerpts from the findings are given as follows:

Machinery Accidents

From the standpoint of cost, the third ranking group of accidents of the 1,138 ice injuries were those involving machinery. Accidents involving scoring machines accounted for 77.5 per cent of the machinery accident cost. Almost all of the scorers concerned were of the type not equipped with conveyor chains. On such machines no practice is to be more condemned than that of using the foot or hand to push a block of ice through the saws. There is no evidence in accident reports that the employers involved conscientiously permitted such hazardous work practices. On the other hand, there is little evidence that these acts were officially banned. Conclusion to be drawn, therefore, is that neither the employers nor the employees seriously questioned the danger of placing the hands and feet on blocks of ice close to the saws.

Chance and the margin of human error brought about the penalties which should have been expected by the operators and the employees as well. In one such case, an employee pushed a block of ice with his hand. The hand slipped from the ice and was half severed by the scoring saws. A second man used his foot. Two toes were amputated and a third mangled. The supreme forfeit was paid by a third employee whose right leg was ripped completely off at the knee. Alone at the time, he was discovered a few minutes later sitting on the floor, watching his life bleed away.

As stated, most scoring accidents were in conjunction with machines not having conveyor chains. It is false security, however, to feel that it is safe to use the hands or feet to push ice through scorers with conveyor chains. In one such instance when the scoring operator pushed on the ice with his foot, his trouser leg became entangled with the chain. Before the employee could free himself, his leg had been pulled against the saws and cut bone deep. The leg was 40 per cent disabled and the man was doomed to be a permanent cripple.

Many New Workers Victims

Many of the scoring victims in this study had been employed only a matter of days or weeks before they were injured. Only their employers could vouch for the kind of preparation they had been given for their jobs or what part of that preparation was dedicated to safety instruction. And only their employers could describe the means used to follow up on the work of the new employees to see that safety instructions, when issued, were being observed.

Scorers of the non-conveyor chain type are often fed by one block of ice being used to push another block through the saws. This procedure is widely accepted and is recommended as safe practice. When only one block of ice is to be fed through any scorer and it fails to pass between the saws, a pike should be used to push it the rest of the way. If use of the pike is not successful, the scorer should be stopped until the ice has been unlocked. It should be understood that the criticism and recommendations made do not refer to the mere act of pushing ice into scorers with the hands or knees. The taboo is placed on the use of any part of the body to push ice through scorers.

Since scorers without conveyor chains are the principal source of scoring injuries, there is one additional recommendation to be made and operators are asked to consider it for its ultimate value . . . the saving of human beings from crippling and fatal injuries. It is possible to adapt most of the scorers in question with conveyor chains, and thereby discourage the hazardous acts described. Too expensive? Too much trouble? Are these the answers? If so, the question becomes one of a sense of values . . . whether or not the money and time expended are worth more than the safeguarding of human life and limb.

Vending Machine Sells Ice Picks

A DULL or broken ice pick is an annoying nuisance. Frequently the defective pick builds up dissatisfaction with the ice as well. Yet we know that ice picks are used for many different tasks around the house and frequent replacement is necessary. The answer to the problem is to make ice picks readily available to ice users at all times.

The ice pick vendor is installed at the end of the platform of the cash and carry station. An attractive appliance, it stands beside the vertical ice sign.

The problem is best solved by selling ice picks through automatic vending machines according to Harry Oderman, president of the Detroit City Ice and Fuel Co., large ice producers in that city. He tested his ideas this summer by placing ice pick vendors in advantageous locations. Experience demonstrated public acceptance of the idea. During July the first machine placed had a total of 339 ice pick sales. The three machines which comprise the first group of installations were placed at cash and carry ice stations and all showed good results. Mr. Oderman feels that other locations would prove equally satisfactory.

Because candy vending machines were available in designs very similar to what is required for selling ice picks, this type of machine was employed. It was converted to vending of ice picks.

Wide interest has been created by this development among ice people who have heard about it. It is expected that these special machines for ice pick vending will be placed in regular production and made available to the industry generally.

American Ice Promotions

JOHN H. MESEROLL and Adrian O'Donnell have been appointed vice presidents of American Ice Co. Charles Silbert, named a vice president last year and with the company since 1917, has been elected to the Board of Directors to succeed James T. Murray, retired.

Mr. Meseroll, who has been with the company since 1921, will head the Laundry Division. Mr O'Donnell, who became associated with American Ice in 1924, succeeds John H. G. Pell who has resigned, and will assume charge of fuel operations.

WINNERS OF THE 50,000 Alice Pure MERIT POINT CONTEST
from everywhere in the great City Products Corporation
50 WINNERS
50 WINNERS
FOURTH WINNER
SECOND WINNER
FIRST WINNER
THIRD WINNER
FIFTH WINNERS
NEXT 5 WINNERS — 1000 MERIT POINTS EACH
NEXT 10 WINNERS — 500 MERIT POINTS EACH
KEEP ON SELLING!
WATCH FOR THE NEXT
Alice Pure CONTEST
Earn Extra Merit Points!

This poster announced the winners in the Alice Pure Merit Point contest of City Products Corp.

Contest Creates Ice Appliance Sales for City Products Corp.

A TWO-MONTH ice appliance sales contest, conducted by the merchandising department of City Products Corp., Chicago, throughout all of the company's ice manufacturing operations, in cities all over the country, has proved that a well planned contest with an equitable incentive for every participant to "shoot at" will produce interest and more sales. The name, Alice Pure Merit Point Contest, brought out the subtle reminder as to the purity of the product, ice, used in the ice appliances sold.

Names of prospects for all ice appliances, domestic refrigerators, watercases, and others, were solicited from all employees, as well as ice dealers, for the first requirement. These names were then filed for sales promotion, and when sold, either by the employees themselves or by salesmen, these "sold prospect" slips qualified the prospector to enter the contest. (Regular prospect commissions were paid for completed sales.)

Contest Entry Form

The contestant then participated in winning one or more of fifty awards, by filling in a "Contest Entry Form," in 100 words or less, the story of how they got their prospect and how the sale was made, in their own words. The contest rules and entry forms were mailed to all ice people and the entries were forwarded to the Merchandising Department by their local office . . . judging of the many entries took four judges three days to select the fifty best answers, and decide the winners.

A very interesting objective was accomplished. In reading the essays from ice people all over the country the company found out much about such things as the outstanding qualifications of some employees in their approach to the prospect; new selling ideas; using the users; bringing the ice appliance to the prospect's door. Of course, some negative thinking too was brought to the foreground.

In general these answers gave an insight to the valuable sales potential of the company's ice people, plus the fact that they took the opportunity to express themselves in writing. The main objective, of course, was to increase the sale of ice-using appliances. The results for the two months of July and August, in which sales are normally below the earlier months of the year, showed sales 28 per cent greater than the same period in 1948 and 20 per cent greater unit sales than in May and June, 1949.

Poster Announces Contest

The contest was introduced to all ice people with a bright colored poster, showing Alice Pure offering the 50,000 merit points for ice appliance sales, and the contest rules. This poster was placed in all locations where ice people gather. There were two mailings directly into the homes of employees, with an invitation to participate, and a catalog of prizes not only reaching the contestants but also their wives and families, who became interested in having a winner in the family.

At the conclusion of the contest, rather than just announce the winners, by bulletin and issue the awards, a poster was made up in which photos of the major prize winners from every part of the company were included. This final poster was designed as a nucleus for other contests to follow . . . giving due credit to the winners of this contest: demonstrating that there were hundreds of participants in the contest, and laying the groundwork for the next contest.

Reports From Unit Ice Associations

Indiana Association of Ice Industries

By Robert W. Walton, Exec-Secy.

THE Indiana State Fair in Indianapolis again provided the Indiana Ice Industry the means of demonstrating the values of ice in handling fresh vegetables. This year the Indiana Association of Ice Industries cooperated with both the Indiana 4-H Clubs and the Indianapolis Vegetables Growers Association in their exhibits in the Horticulture and Agriculture Building at the State Fair.

Prize winning farm exhibits in the 4-H Division were high-lighted in a specially constructed ice case. Such special handling of these prize winning vegetables made it possible to maintain them in a fresh condition throughout the nine days of the Fair. It is hoped that ice protection can be extended to all 4-H farm exhibits at next year's Fair.

Displaying their vegetables in two 6-ft. ice display cases, the Indianapolis Vegetable Growers Association carried off top honors in their division at the Horticulture and Agriculture Building. These two attractively dressed cases were flanked by ice block shells containing fresh vegetables.

Developing nutritional factors of vegetables as their educational field, compiled with an eye appealing ice exhibit, the Indianapolis Vegetable Growers Association won the unanimous approval of the judges. The members of the Association were eloquent in their praise of the part ice played in their exhibit.

The equipment used in the Vegetable Association Exhibit was furnished by Polar Ice & Fuel Co. of Indianapolis. Mrs. Harriet Gray of that company was in charge of building the iced vegetable display and her expert advice and know-how contributed greatly to the success of the Exhibit.

Ice Sales for 1949 have not as yet equalled sales of 1948. Temperatures during the month of August were disappointing and ice distributors were not able to maintain a high level of sales activity. Generally speaking, refrigerator sales picked up during August, but again did not match 1948 levels.

The research activity in sweet corn icing developed into a highly successful project, details which should be forthcoming from the Research Department of the National Association.

A Northern Indiana merchandising forum district meeting was held at Lake Wawasee on August 16, 1949, which was well attended by ice companies in the Northen Indiana Section. This meeting featured a discussion of the new competition in form of automatic ice machines. A southern district meeting at Spring Mill State Park is scheduled for October.

Missouri Ice Manufacturers Association

By V. A. Esphorst, Secretary-treasurer

PLANS are being made to make the annual convention of the Missouri Ice Manufacturers Association which will be held at Hotel President in Kansas City, Mo., on January 9, 10 and 11, 1950, one of the biggest and best in the history of the association. This meeting will mark the 25th anniversary of the association.

Details of the program with names of speakers and their subjects and the entertainment program will be announced later.

Canadian Association of Ice Industries

By K. C. McCrea, Exec.-Secy.

THE outstanding development in the Canadian Association this summer has been the formation of a new Public Relations Committee. It is the responsibility of this committee to arrange for showings of "Naturally Yours" Kodachrome film and Peggy Porter Salad Films at women's group meetings and both annual convention and district meetings of all industries having any interest whatsoever in the use of ice. This committee has made a survey of all such associations in Canada of which it now has a list in excess of fifty. Letters are being sent to the executive officers of these associations describing the films, offering showing without cost and offering to provide speakers at their conventions on the topic of "Ice" as it may relate to their particular industry. This program is expected to produce valuable publicity on the usefulness and desirability of ice refrigeration.

This committee has also made contact with the various boards of Education throughout the Dominion with a view to distributing booklets describing the ice industry and the modern uses of ice. The committee is also completing arrangements to supply specially prepared text book paper covers, carrying an ice message, to Association members at cost.

After having held the Canadian Ice Convention in the spring of each year since the Association was formed back in 1922 it has been decided to move it ahead to November of each year, to permit advance showing of ice refrigerators for the ensuing year and to enable members to put into practice new merchandising and operating ideas presented at each annual convention. The next Convention which would normally have been held in April 1950 will now be held at the General Brock Hotel, Niagara Falls, Ontario, November 8, 9 and 10, 1949. Those who expect to attend should make their hotel reservations early.

The Canadian ice industry has enjoyed a bumper year from coast to coast. In Central Ontario the demand was so heavy that many companies were forced to bring in ice from distant points. A serious ice shortage that would most definitely have resulted in rationing was averted by an easing up in the temperature around the end of the month of August.

It is expected that Canadian ice refrigerator manufacturers will display entirely new lines of ice refrigerators at the November convention.

Florida Ice Association

THE 24th annual convention of the Florida Ice Association will be held October 13-14 at the Soreno Hotel, St. Petersburg, Fla. According to an announcement from the association office the fundamental S's of good management —Sales, Service and Safety—will be discussed by National and state speakers who are authorities in their field. Facts from the restaurant and dairyman's standard will be discussed by two of their representatives.

Those who come to this convention, it is promised, will know the true meaning of the phrase "Southern hospitality" after attending the welcome party. A luncheon will be provided for the ladies and additional entertainment for all will include a delicious buffet dinner followed by a water show and ending with dancing under the stars and palms.

Florida Short Course for Ice Industry

FLORIDA'S educational program for ice manufacturers was expanded on a regional basis when the University of Florida's General Extension Division and the Florida Ice Association held a three-day short course in Miami Beach August 1, 2 and 3.

The program was planned by a committee from the ice industry, headed by F. M. Pumphrey, vice-president of the Florida Ice Association. Muriel Washburn, executive secretary of the Association and F. H. Cramer of City Ice and Fuel, Miami, handled local arrangements. G. M. Turner of the General Extension Division and Dr. A. P. Black represented the University of Florida in conducting the course.

A session of the Florida short course is held in a room of the Royal Palm ice plant, Miami.

The sixty persons enrolled studied under faculty members who were obtained from the industry and from universities to provide a balance between theory and practical application of theory.

Dr. A. P. Black of the University of Florida and a national authority on water supply and treatment was assisted by Clarence Henry of Miami's Water Department in giving laboratory demonstrations of water tests used in ice making. C. E. Anderson of the University of Miami discussed "Heat as Related to the Manufacture of Ice." F. M. Pumphrey and F. H. Cramer of City Ice and Fuel handled "Behavior of Refrigerants and Evaporating and Condensing Surfaces."

Herbert R. Beers, president of the Florida Ice Association told short course students about gains derived from good plant housekeeping. E. J. Hill of Middle Florida Ice Co. gave a graphic description of machinery units in the modern ice plant and the part each plays in the manufacture of ice. B. W. Murray of the Sinclair Refining Co. answered numerous questions about efficient machinery procedures. Larry P. Hoffman, Safety Director of Florida Power and Light, pointed out procedures for preventing accidents.

The University of Florida's General Extension Division places great importance upon audience participation in its evaluation of a short course. By this measure, the program was a success. Comments from the floor were instructive; questions frequently led to important discussions not planned by the lecturer. Experiences in problem solutions, as related by students, were invaluable to the total instructional program on ice making.

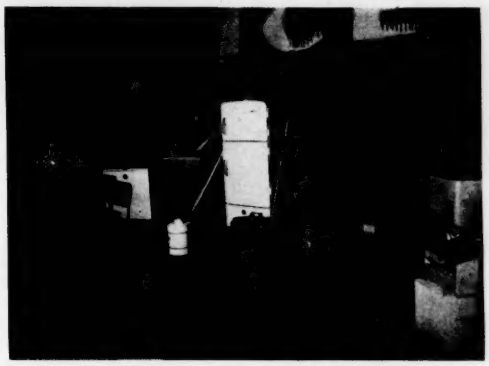
While the short course was devoted largely to the manufacturing of ice, some attention was given to public relations, selling, and public service. The University of Florida and the Florida Ice Association were requested to investigate the resources available for holding short courses which would afford instruction and stimulate interest in these subjects.

Those responsible for administration of the short course obtained many ideas which will give further impetus to an expanded program of informal University training for Florida's Ice Industry.

Ohio Association Booth at State Fair Features Ice and Appliances

AN attractive and educational booth was shown as usual by the Ohio Association of Ice Industries at the Ohio State Fair this year. The fair ran from August 27 to September 2 and the attendance broke all records. This was reflected at the ice industry booth which also broke all records.

This year the exhibit featured ice appliances of all kinds. These were arranged in a semi-circle with streamers as shown in the illustration, leading to one key word "Ice." This theme was chosen because it was believed that it represented generally the interest of all the members of the association. In most instances, the units shown were kept iced and displayed as they are used normally.



Ohio Association booth at the Ohio State Fair.

Wm. R. Cunningham of the City Ice & Fuel Co., Columbus, was in direct charge of the booth for the association. The response to the exhibit, according to Mr. Cunningham, was very good. Inquiries from visitors were directed to the home ice company in the usual manner and Mr. Cunningham says they had good reason to believe that most of these were not "just looking."

Illinois Ice Merchandising Council

AN IMPORTANT meeting of the Illinois Ice Merchandising Council will be held at the Leland Hotel, Springfield, Sunday, October 9, starting at 10 a.m. New officers will be elected to fill vacancies and plans will be discussed looking forward to selling more ice and ice-using appliances during the winter season. It is expected that in addition to sales personnel, management will be well represented at this meeting. To sell more ice it is necessary to sell more ice using appliances and management is beginning to recognize that fact and to take a more active interest in this phase of the business.

The Practical Refrigerating Engineer

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QUESTIONS AND ANSWERS

National Association Practical Refrigerating Engineers

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435 North Waller Ave.
Chicago 44, Ill.

1949 Convention at Purdue

Details of the Educational Program

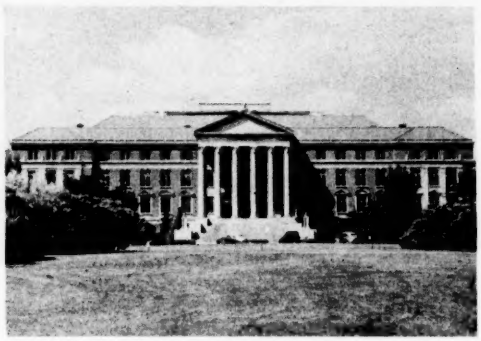
THE 40th Annual Convention at Purdue University on November 8-11 will offer a wealth of engineering information to the attendants. The broad program that has been arranged will include numerous subjects that hold the most interest for engineers in refrigerating plants.

The program opens with a discussion of refrigeration plant details which contribute to efficiency and reliability of operation. Too frequently these matters are overlooked or neglected. They will be described and illustrated by Eugene Rytlewski, Westerlin and Campbell Co., Chicago.

Design and Operation Details

For those who require any further proof of the importance of the foregoing subject, James Oldani, Central Illinois Ice Co., Springfield, Ill., will give data on the results obtained in an ice and cold storage plant by attention to such details. His informative presentation of benefits from careful design and good operation will appeal to all engineers.

What the Dairy Operator Expects from Refrigeration Plants is the subject of a paper by Carney Nickerson, Borden-Furnas Ice Cream Co., Indianapolis. Incorporated in his discussion will be recommendations for good operating practice.



The Executive Building in which many of the administrative offices of Purdue are located.

On the first evening of the convention the popular Bureau of Refrigeration Information will give all of the convention attendants an opportunity to present problems for discussion by experts. Opinions and suggestions from all around the country will also be a part of this clearing-house for refrigeration information.

Purdue Memorial Union, headquarters for the 1949 Convention.

Chemistry, Instruments, Electric Equipment

The Purdue staff will take over the next session with three features of special interest. A lecture-demonstration on Chemistry for the Refrigerating Engineer will cover those phases of the subject with which plant engineers wish to be familiar. Highlights will include corrosion control, condenser water treatment for scale and algae, chemical scale removal, and the operation of water treating equipment.

The Use and Care of Plant Instruments has taken on added importance in view of the increased tendency toward strict operating economy. A lecture-demonstration on this subject will prove intensely interesting to all engineers who wish to get the most out of their plants and want details on how to accomplish this.

The Checking and Care of Electric Equipment will be the third lecture-demonstration in this session. The best methods of checking electric equipment will be discussed

and the use of the newest instruments available for this purpose will be demonstrated. The information offered will permit engineers to take the guess-work out of matters concerned with condition and operation of their electrical equipment.

Welding, Testing, Plant Tools

Professor P. W. Case of Purdue University will discuss the Fundamentals of Good Welding. Now widely used in original construction, welding also offers great assistance in modernization and refining of existing systems. What good welding involves and how it can be used are thus of great importance.

The Testing and Checking of Refrigerating Equipment will be discussed by Professor H. G. Venemann. The industrial plant can frequently make use of good testing methods to determine results being obtained from various pieces of equipment. The discussion of this subject will be a preliminary to a later demonstration in the laboratory.

Professor O. D. Lascoe will give the details of the best methods for handling the usual machinery maintenance jobs in the plant. During the past few years tool refinements and better methods of use have been developed. Professor Lascoe will tell about this and show how refrigerating engineers can utilize these advances.

Demonstrations in the engineering laboratory are then scheduled to supplement the information given in the earlier papers and discussions. The laboratories of the university are especially well equipped and provide abundant opportunities for such demonstrations.

Final Session

Air Conditioning Methods and Equipment will be discussed by Professor William Miller. The speaker is noted for his ability to simplify presentation of his subject and make it understandable yet complete.

The Mechanization of Railway Car Icing will be described by A. R. Carlson, Railways Ice Co., Chicago. The increased volume of perishable transportation, along with the better protection being provided for refrigerated commodities has increased the demand for speed in car icing operations. Economy is also a continuous objective. The speaker will describe how these and other objectives are attained by recent mechanization.

J. P. Ferron, Superintendent of Safety, Pacific Fruit Express Co., will discuss the important subject of Accident Prevention. He has the responsibility of organizing safety work in the far flung operations of his company. His discussion will show how accident prevention work is both practical and profitable whether operations are large or small.

The numerous features on the educational program at the Purdue Convention guarantee a profitable time for all of the engineers who attend the meeting. The central location of the meeting makes attendance especially convenient for engineers in the middle west. In addition a number of men from other sections have expressed their intention to take advantage of the fine program offered at the Purdue Convention.

The exhibits by manufacturers of equipment and supplies will provide a good supplement to the engineering program. They will be located at the entrance to the convention hall where attendants will have a good opportunity to study the equipment shown and discuss their problems and needs with the manufacturers' representatives.

Entertainment

The Annual Dinner will be the feature of the general entertainment program. It will be held on Wednesday Evening, November 9. Special events are scheduled for the entertainment of the women attending the convention.

In the afternoon of the first day a party has been arranged to get everyone well acquainted and promote the renewal of friendships of other years. A special movie program will be provided in the evening when the men are attending the convention session. A sight seeing trip to points of interest and historical significance will be an enjoyable feature of the third day of the convention.

Room reservations for the convention are being handled through the national office of the association, 435 N. Waller Ave., Chicago 44, Ill. Requests for accomodations should be sent there.

Planning and Carrying Out a Good Plant Maintenance Program

By James Stubblefield
Public Service Ice Co., Cairo, Ill.

THE task of keeping an ice and refrigeration plant in first class condition requires the constant attention of all those who work in the plant and use the equipment. Plant maintenance is not a program to be carried out entirely during the off-peak season. Many times a major repair can be averted by close observation of the equipment while it is in service and a possible minor repair made at that time. During the war this was called preventive maintenance and it continues to be a good idea now.

At first glance it might be assumed that the important parts in a maintenance program are: the necessary repair parts, good tools, and proper methods of doing the work. These are essential but there is much more to a good program than these three items. Planning must come first and it should be based on thorough knowledge of the plant and its condition. For this purpose a complete, well kept log sheet is the first essential. By studying this log from day to day the operator is able to detect any unusual condition at once and then is the time to make observations and attempt to find the cause for these conditions. A change in suction temperature or pressure, a change in discharge temperature or pressure, a change in water temperature or pressure, a change in electric current meter readings and many other changes may be observed by regular reading and recording of various instruments.

Of course the plant must be sufficiently provided with suitable instruments to gauge the operation of the ice making system. I suggest that all readings be made and recorded at least every two hours. Any unusual conditions observed during an operator's shift should also be recorded

in a space provided on the log sheet, such as, power interruptions, loss of suction of pumps, excess temperature of machines or bearings or any other than normal condition. Also a note should show whether a permanent or temporary adjustment has been made.

A plant notebook is a valuable supplement to the daily log sheet. This may be kept by the chief engineer or the person who is responsible for the plant maintenance program. Notes should be made during the operating season of all needed changes or repairs that come to his attention. As time permits, these alterations or repairs are attended to and the notation crossed off. If this system is used, it is not likely that anything will be overlooked during the repair period. The chief engineer in our plant had on record 37 jobs other than routine jobs at the close of last season. The following list shows typical items taken from the plant notebook:

1—Scrape and clean steel structural work on loading platform and prepare to paint.

2—Move dehumidifier brine circulating pumps to a more convenient and dry location.

3—Open and inspect No. 1, 2 and 3 ammonia compressors.

4—Inspect, clean and repair all air laterals and tubing.

5—Clean chemical mixer and all lines to water filters, also settling tanks.

6—Overhaul crane hoist and install new clutch and gears that are on hand.

7—Install new I-beam under scoring machine and thoroughly repair and paint the machine.

8—Paint all motors and equipment that was not painted last year.

9—Check heating boiler and clean before firing up.

10—Clean and re-paint electrical switch boxes.

11—Install new valve in ammonia discharge line between heat exchanger and condensers. New valve stem in king valve and re-seat leaky valves on compressors.

12—Paint steel beams inside of plant.

13—Dismantle, clean and repair 40 hp. Sync. motor driving No. 3 ammonia compressor.

14—Add salt to brine bringing strength up to 80 per cent (salometer reading).

15—Install new sprocket wheel on feed chain to scoring machine.

16—Re-set take-up on conveyor chain in daily storage.

17—Make permanent repair to ground wire on crane motors.

18—Repair steel plate in front of can dumps.

19—Install small door in sizing room.

20—Solder drain pipe on roof of daily storage.

21—Repair drain pipe on garage.

22—Install new sills under blower on retail platform.

23—Install extra set of coils in ice sizing room.

In planning the annual overhaul, the work should be handled in a routine manner in order that no apparatus will be overlooked. As the entire equipment is necessary for full production, I will not attempt to list the most important first but will name the parts of the plant in the following order.

Ammonia compressors, ammonia condensers, freezing system, air agitating system, water circulating system, raw water system, engine room and storage room piping and valves, electric motors and starters, other auxiliaries, and will mention painting, and last but not least, housekeeping.

Ammonia Compressors

To simplify the discussion on ammonia compressors I will confine my remarks to the vertical, enclosed single-acting compressor. Several companies manufacture the enclosed type machine but in general, they all operate about alike. Some of these machines are driven by a synchronous motor, directly mounted on the crank shaft and others are belt driven from a motor mounted on a separate base.

Annually the inspection plate should be removed from ammonia compressors, the oil drawn out and the interior completely cleaned. The bottom of the crank-case should be inspected for particles of metal that could possibly come from chipped or worn bearings. The presence of these particles, would indicate very close inspection. Oil passages should be inspected and if dirty they must be cleaned out. This applies to outside piping as well as inside passages. The openings to sight-feed glass should be clear. In case gasoline or kerosene has been used for cleaning, all parts must be wiped dry with a cloth that is free from lint, and thoroughly aired. Then a coating of ammonia oil should cover all parts before placing back in service.

After all bearings are checked and the interior of the crankcase has been re-checked to be sure that tools and other material have been removed, oil may be poured in up to the inspection plate opening. Then the inspection plate can be replaced and the crankcase filled to the proper level with oil. The oil filters also must be cleaned as well as the outboard bearing. Even though the compressor appears to be operating perfectly, it is a good idea to remove the cylinder heads every two or three years for inspection at the time the lower side is opened up. The valves, springs and seats should be observed as well as the piston rings and cylinder walls. When everything is in good shape after a thorough cleaning and possibly the grinding of the valves and safety heads, the heads may be replaced and a notation of the inspection should be made on the log sheet. While the machine is pumped out it is a good time to re-pack if that is needed.

Condensers

Practically all waters are scale-forming. Scale on a condenser pipe acts as an insulator and retards the heat flow from the ammonia to the cooling water. The condenser surfaces should be kept as free from scale as possible at all times to secure a minimum condensing pressure. Here is where the plant log and instruments will be of assistance. Comparison of the temperatures of the gas to the condenser, liquid from the condenser, water on and water off the condenser will indicate pretty well what is going on inside of the condenser. It is safe to assume that two to four degrees difference between the water off and the liquid off the condenser is the maximum of operating efficiency. A wider range than that will indicate either dirty condensers or poor distribution of water over the condenser.

Examination should be made to determine the presence of leaks in and around the condenser. White scale forming deposit on the surface in contact with the cooling water will indicate a leak there. Nessler's solution is sometimes used to detect the presence of ammonia in the cooling water, which will indicate a leak inside of the condenser or tubing. Burning sulphur sticks around joints and fittings that are in the open air will help find leaks there.

All bolts, fittings and stands should be inspected for corrosion and replaced before a failure results. It is well to be sure that the water is flowing over a condenser after a shutdown before the compressor is started. Otherwise cold water will come in contact with hot pipes and may cause a rupture of the tubes or shell.

Non-condensable gases are always getting into an ammonia system and they very materially effect the operation of the plant. A non-condensable gas separator or purger is a very valuable piece of equipment and should be kept in first class operating condition at all times. Also it is well to be sure that the purger is properly connected so that it is completely effective.

Freezing System

This system consists of tank, cooling coils, agitators, ice cans, framework and tank top and it represents a large part of the plant investment, thus it should receive a good portion of time devoted to plant maintenance. Careless handling of tank hoist is responsible for considerable damage to freezing system equipment. Only a steady and careful workman should be allowed to operate the hoisting and conveying machinery.

Corrosion is one of the greatest enemies of the freezing system. It is being controlled to a minimum by the proper treatment of the brine, keeping it as near neutral as possible or a pH value of 7. A pH below 7 indicates that the brine is acid and a pH above 7 indicates that the brine is alkaline. There are several chemical concerns who specialize in brine treatment and they can analyze and recommend treatment accordingly.

Agitators, core pumping equipment and tank surfaces are constantly in need of attention and deserve careful attention.

Air Agitating System

The air agitating system is responsible to a great extent for the quality of ice manufactured. The compressors should receive the same inspection and care as the ammonia compressors. Air is usually taken in from the outside and contains a certain amount of dust and moisture, therefore the air compressor cylinders and valves require more attention than the ammonia cylinders. A positive feed of oil is necessary at all times into the compression chamber. This supply of oil though it is small should be constant. One or two drops per minute is sufficient in most ice plant compressors.

All air piping, storage tanks and laterals should be inspected regularly. Most of this maintenance can be kept up during the operating season, especially if a duplicate compressor is available. The dehumidifiers require very little attention other than the brine circulating pump which requires the same consideration as any other pump in the plant. Care must be exercised in reversing the flow of brine and air through the dehumidifier being sure that the outgoing air comes in contact with the coils carrying the incoming brine.

Water Circulating System

This system plays an important part in the manufacture of ice and without a good supply of water a plant cannot operate. Lack of water due to obstruction in pumps or pipes or on account of pumps losing their prime causes the condensing pressure to rise immediately. Pumps should be dismantled during the overhaul season and thoroughly cleaned and inspected. Pump packing must be kept in good condition. Spray towers that are exposed to sun and wind need considerable attention. Spray nozzles will stop up and they must be kept clean. Leaves and dirt accumulate very rapidly in the bottom of the spray pan and that needs removing regularly. Those plants that use deep well pumps and discharge condenser water into the sewer do not have a spraypond or spraytower problem but the deep well pumps and wells are major maintenance items.

Raw Water System

Raw water is treated in various ways for ice making; the most common being with lime, alum or other chemicals. A chemical mixer is usaully placed above a settling tank and in an out-of-the-way place. Therefore it is very apt to be neglected. Chemical dust enters into the motor drive and bearings and if they are not inspected and cleaned regularly, heating and possible burning up of the equipment will result.

The settling tank and forecooler will usually go through a full season without being cleaned, providing that the settling tank has been sludged in accordance with the amount of chemical that has been used. The sand and gravel filters must be backwashed properly at regular intervals and the heads should be removed at the end of each season. Water engineers usually recommend filters of sufficient size to take care of a full season without renewing the charge but if the capacity of the plant has been increased since the original installation, it may be necessary to renew the filter charge more often. To recharge these filters, it is necessary to remove all of the sand and gravel and thoroughly inspect the distributing pipes in the bottom and be sure that they are not stopped up. Then charge according to the manufacturers' instructions. Booster and raw water pumps require the same care as other pumps.

Ammonia Piping

All leaks in ammonia piping should be taken care of as quickly as possible. A well operated plant is usually free from ammonia odors only because the maintenance program is complete. All valves that have failed to hold perfectly during the season need re-seating. This is done by pumping out the entire line and while you are at it, you had just as well repack and reseat or at least inspect every valve that you can get into. Most ammonia valve stems can be repacked while the pressure is on the line by opening the valve wide and seating it firmly against the packing chamber. Do not tighten ammonia valves by applying a wrench to the valve wheel. This is what causes the soft metal to be squeezed out of the seat resulting in a leaky valve.

Motors and Electrical Equipment

In a raw water ice making plant, almost every piece of equipment is depending on an electric motor for its operation. Each motor is depending upon a control and wiring for its operation. Many motors are very much abused and expected to run continuously for years without any attention. It is remarkable just how much a motor will stand, so with a little bit of care, they will do their part.

Under ordinary conditions a motor should be dismantled and cleaned, revarnished and the bearings and wiring checked every two years. The ends of the motor can be removed and then the rotor will slip out, thus leaving the whole motor pen for inspection. Wash the end shells thoroughly with gasoline or kerosene and then check the bearings for wear. In case new bearings are needed, a number is usually found on the old bearing and it with the serial number, size, etc., may be sent to the manufacturer and they will furnish bearings made epecially for that motor. When re-assembling motors of the ring-oiled type, be sure that the oil ring does not fall into the slot provided for it to run in, and become damaged by the end of the shaft. Turn the whole end or (bell) upside down while slipping the bearing over the shaft. Motors operating in dusty or damp places need to be cleaned and inspected as often as necessary, according to the conditions.

Electric switches must be in good condition. Care must be taken to be sure that the proper size fuse is protecting the equipment that it controls. Contact points burn occasionally and need to be replaced. Also, the oil in compensators and oil breaking switches must not be regarded as unimportant. All contacts must be kept tight and bare wires insulated against possible contact with metal boxes or other wires.

Auxiliaries Not Mentioned Previously

A few auxiliaries such as hoisting equipment, emergency standby equipment, conveyors, heating plant, belting, storage room doors, storage room insulation, scoring machines, ice crushers and buildings in general have not been mentioned but they are all necessary parts of an ice making plant. Many of these are listed in the engineers note book as needing some attention.

Painting

For a successful business, paint is a necessity. It is economy to use paint on most surfaces as it offers protection against the elements. Not only that, it proves that the company and its personnel show a certain amount of pride in their vocation. A plant that is kept painted draws attention from the public and they have confidence in that company as well as the product that they sell. Painted buildings, walls, floors and equipment are certainly an asset to any industry.

Housekeeping

Last but by no means least, I will mention housekeeping. Although briefly covered here it requires careful, constant attention. Housekeeping has everything to do with maintenance. Any equipment will operate better and longer in a clean atmosphere than in a heap of rubbish and filth. Workers will produce better work in a plant where good housekeeping is practiced; they will be healthier and accidents will be reduced to a minimum.

All dark corners that are apt to become catch-alls for rubbish should be cleaned out and lighted, receptacles provided and placed in convenient locations to receive the rubbish and someone assigned to empty them daily. Water hose, brooms, mops and pails should have their place so as not to create a tripping hazard. Tools must have their place and be kept there.

During the process of cleaning and wiping machinery, an operator will very often discover a loose bolt, a stopped-up oil line or some other potential breakdown. A clean and orderly plant hardly ever breaks down.

N.A.P.R.E. Question Box

NOTE: H. G. Venemann, Chairman of the Educational Committee, has agreed to answer through this column all questions asked by members of the N.A.P.R.E. Please send your questions to him care of Purdue University, West Lafayette, Ind.

Candy Cases Sweat

Question No. 823: In an air conditioned department store we have a candy department whose cases are cooled by a unit which keeps the temperature of the candy at 70 F. with approximately 50 per cent relative humidity. It operates perfectly in the day-time when the store is air conditioned. At night when the humidity rises in the store the cases sweat and it ruins all merchandise that is on top of the cases and even wets the floor for several feet out into the aisle. These are single glass cases with a blower inside the case.

I would appreciate any suggestions you can give on this problem. I would also like to know the proper dry bulb temperature and wet bulb temperature to keep the candy in these cases.—C.W.S.

ANSWER: The complete answer to the problem would be to use double glass cases properly sealed and constructed for the temperature and dew point conditions under which they operate. This solution, I assume, would be considered too costly.

An air conditioning unit to operate at night and keep the zone around the candy cases at a dew point below 70° F. would also be a solution, but this seems impractical from the standpoint of space occupied by the unit and perhaps the difficulty of distributing the air properly around the cases.

Your difficulty is that the outside surface of the single glass is below the dew point of the surrounding air. Therefore the glass condenses moistures. The relative humidity inside the case has nothing to do with this sweating action because it is solely a matter of temperature of the glass. The problem could be solved by increasing the temperature carried in the candy cases to above the dew point of the store air at night. Whether you can do this depends upon the type of candy in the case and the length of time it stays there before it is sold.

Your best course if you want to follow this idea is to check with the candy manufacturer to see how high you can carry this temperature without having the candy change color. Because there are so many different types of candy and the length of holding in the case is unknown, I would not want to make a specific recommendation on the maximum temperature that could be safely carried, but the candy manufacturer is in good position to give this information to you.

If the manufacturer suggests a temperature which is still below the dew point and the sweating continues, I would suggest that you make arrangements to cover the cases at closing time with tightly woven cloth or a plastic cover made of vinylite or something similar. Such covering should cut down air circulation against the glass to such a point that the sweating would be reduced to a non-troublesome level.—Emerson Brandt.

Gas Storage

Question No. 824: We are analyzing the matter of adding fruit storage space to our plant. Occasionally I read about cold storage methods which use a certain percentage of carbon dioxide or other gas in the storage room to aid in preserving fruits. Is this gas storage really effective and how is it handled?—L.W.R.

ANSWER: A very comprehensive discussion of Gas Storage is published in Chapters 13 and 41 of the Applications volume of the A.S.R.E. Data Book. At the end of Chapter 41 will be found twenty references on the subject. I will quote briefly from the Data Book.

"There are numerous "gas storages" in England and an extensive one at Elgin, C. P., South Africa. In this country storage of McIntosh apples in modified atmospheres is now commercially practiced to a limited extent in New York State. Commercial trials have been successfully conducted with the Yellow Newtown in California and extensive experimental tests with Jonathan in Iowa and McIntosh in Canada.

"In commercial practice modified atmospheres are secured by filling gas tight cabinets or rooms with fruit and permitting respiration to diminish the oxygen content of the air and build up the carbon dioxide concentráiton. For each part of oxygen consumed approximately one part of carbon dioxide is liberated. Respiration is allowed to continue without ventilation until the oxygen is reduced to the desired amount, this being controlled subsequently by ventilation. Should the carbon dioxide concentration be higher than desired, the excess may be removed by circulating the "air" through a washer or "scrubber" filled with 30 per cent sodium hydroxide solution.

"Different varieties of apples and even the same variety grown in different localities may respond somewhat differently to the same proportions of carbon dioxide and oxygen in the atmosphere, and experimental work is being conducted to determine the effects of diffrent atmospheres

at different temperatures. Essentially equal parts of CO_2 and O_2 (10.5 per cent CO_2 and 10.5 per cent O_2) have been found to be very satisfactory concentrations for the Bramley Seedling in England and also for Yellow Newtown in California. For most apple varieties a relatively low concentration of carbon dioxide and a reduction of the oxygen content to the minimum capable of supporting respiration appear to give the best results.

"Because of the difficulty and expense of making storage rooms air-tight, the extra attention required to maintain the atmospheres at the proper concentrations, the desirability of keeping the room closed and undisturbed for long periods, and the necessity of supplying workers in the room with oxygen for breathing, use of controlled atmosphere is not feasible in large commercial cold storages, and promises to be limited largely to farm storages and to that part of the crop which responds unfavorably to long holding at 30-32° F.

Disadvantages. Because of the danger of suffocation and the loss of the required atmosphere in the chamber, the operator cannot enter the storage room for inspection of fruit or manipulation of the equipment. It is difficult to make buildings gas tight. Moreover, controlled atmosphere storage is not universally applicable to all fruits or all varieties of any one fruit.

The double effect of very low storage temperatures and atmospheric control does not always give the full theoretical benefit that might be expected. With certain varieties, concentrations of carbon dioxide as low as 2 per cent are toxic at a temperature of 32 F. Because of this toxicity factor, with many fruits the temperature must be held as high as 40 F. Different apple and pear varieties have different specific atmospheric and temperature requirements for long time storage. This necessitates the use of different chambers with varieties of different requirements.

With apples the scald hazard is increased because of restricted ventilation. For this reason, all apples stored in controlled atmospheres must be treated with oiled papers. —H.G.V.

Loose Compressor

Question No. 825: Our 10x10 ammonia compressor tore loose from the foundation and broke the foundation bolts. On investigation we have found that the concrete of the foundation is impregnated with oil. What procedure would you recommend for renewing the foundation bolts and regrouting the compressor.—H.T.

ANSWER: This question was discussed at two recent meetings of the Rio Grande Valley Chapter. A. F. Doneis, Sec'y.-Treas. of the Chapter has submitted the following comments which were brought out during the discussion of the subject.

1—When setting the new foundation bolts, pack the shielding tin tubes surrounding the foundation bolts with rags or paper to exclude concrete and grout for a distance of a foot or more from the top. This was suggested to allow flexing over a greater length than if the bolt were solidly grouted in. In this manner the stress would be distributed over a considerable length of the bolt and likelihood of failure minimized. (Possibly the original bolts were over stressed by using too large a wrench.)

2—When mixing grout use a 1- or 2-per cent solution of calcium chloride instead of pure water, to serve as a hardening agent, and eliminate a considerable amount of possible shrinkage in the event the cement is not entirely fresh.

3—When pouring the grouting under the machine, push it through from one side only instead of working it in from all sides simultaneously. This will assure a better filling of space beneath compressor due to a clear indication. Also suggestions of inserting tubing or hose under machine into possible pockets that might become air-bound and prevent free flow of grout into confined spaces.

4—Arrange for easy oil drainage off top of foundation.

5—Back off leveling screws or withdraw wedges after grout is hard, and draw down nuts tightly.

The following suggestions were made, in view of the fact that the machine can't be maneuvered about in engine room for lack of space:

Raise compressor straight up on cribbing, knock out old foundation and replace with new concrete base. Chip off as much oil-soaked concrete as posisble, then regrout machine using molten sulphur. One member described how a diesel engine had been securely grouted to an old oily foundation block by this method.

Armin Doneis reported on the final solution: He described the use of a proprietary product which is claimed to be free of shrinkage. One of the ingredients besides an oxidizing agent is finely divided iron which swells to about the same extent as the cement shrinks in setting up. It is commonly used for foundation repairs, floor-repairs, bridge and machine grouting, and is called EMBECO, made by Master Builders Corp. Mr. Doneis could not give final judgment of the product as the machine would not be put back into service until next season, but he was well impressed with the claims and was optimistic in the belief that the job would stand up in service.—H.G.V.

Supplemental Answer to Question No. 814

MAY I add some further comment in the discussion of Question No. 814 concerning flushing of lube oil from evaporator coils, In connection with a similar question in our last New Orleans NAPRE Convention I volunteered the information that in operating a Vilter Packice freezer I found it necessary to use a solvent in the small evaporator to wash out oil and had complete success using each week a couple of pints of "Varsol" a naphtha-like cleaning-fluid sold in South Texas by the Humble Oil Co. I have had no trouble from explosions or other catastrophes as a result of this hydrocarbon in my ammonia system and have found it very effective in cleaning the rather small heat-transfer area of this type of ice-making equipment, in spite of the high temperatures and pressures prevalent in summer months in this hot humid climate.—A. F. Doneis.

New Questions

Cooling Water Treatment

Question No. 826: When applying liquid chlorine to cooling tower water for control of algae and other growths, what concentration should be used in order to be effective and yet avoid attack on the metal of the system?—S.J.C.

Insulation Application Method

Question No. 827: In the application of a 6 inch thickness of insulation to the walls of a freezer storage, which of the following methods is better: (1) apply in three layers, each 2 in. thick; (2) apply in two layers, each 3 in. thick; (3) apply in one layer, using 6 in. slabs of insulation?—L.M.S.

Heat From Electric Equipment

Question No. 828: In the course of our instruction period in the Rio Grande Valley Chapter we were working on a hypothetical problem to calculate the total heat-load of a given storage room which contained a variety of commodities, a number of lights which burned continuously and two motors which operated part of the time.

The question arose as to how much of the power-input of the motors eventually changed into heat-energy within the vault. It was generally conceded in the case of the motor driving a fan that all the power output of the motor plus the motor losses finally showed up as heat which the refrigerating equipment would have to take up. But in the case of the motor driving a conveyor there was a considerable difference of opinion as to the proper portion to include as added heat- load.

It was argued by some that if the conveyor operated in a horizontal plane, then all the power input showed up as heat in the various bearings and sliding chain-links. But that if the conveyor raised the commodities to a higher level, as in the case of an ice-stacker conveyor, then it imparted potential or static energy in the raising of the weight and that this potential energy did not necessarily change to heat in the subsequent lowering of the weight unless a brake was involved in that lowering process within the vault.

We should greatly appreciate an authoritative statement from you on this discussion both from a practical and a theoretical viewpoint. It may be straining at details to try to predict the amount of heat involved and for practical purposes a rough estimate or assumption of total motor input might be safe enough, but our chapter has instructed me to get from you the proper procedure from both the practical and theoretical angles.—A.F.D.

Member Activities

Memphis

By Charles Conley

THE annual round-up and water melon party was a great success. A large number of members and friends enjoyed 1240 lbs. of choice water melons selected by Chairman Doug Smith of the Entertainment Committee.

Two very fine educational motion pictures were shown by Virgil Cox of Esso Standard Oil Co. These were "Historic Virginia" and "Oil for Tomorrow." The Virginia picture showed the complete history of the state with all of its beauties, while the other movie covered rather completely the story of the Petroleum Industry from the location of new fields through the drilling of wells, refining and transportation of the oil. Following this much enjoyed program the group renewed old acquaintance and visited among themselves while they enjoyed the water melon.

At the first meeting in September, J. F. Scully, Republic Steel Corp., showed a motion picture and described how Electrunite boiler and condenser tubes are made. These alloy steel tubes manufactured by Republic are designed for use under conditions which require greater resistance to corrosion and other deteriorating effects. Mr. Scully explained the various steps in the manufacture of the tubes and answered a number of questions from the group in regard to applications.

Lindell H. Doty, assistant engineer, Humko Co., was elected to membership.

The chapter recently distributed the complete educational program which will be followed throughout the 1949-50 season. The lectures on refrigeration and allied subjects include the many phases in which the members are primarily interested. In addition the questions and answers published each month in the magazine will be discussed and analyzed as a part of the educational program.

Rio Grande Valley

By Armin Doneis

After a thorough discussion of the meeting night a vote was taken and more than two thirds of those present expressed preference for Monday night. No change, therefore, will be made in the schedule which has been followed previously. The special speaker of the evening was Asa Hord, D. W. Haering & Co., who discussed water conditioning and dealt with the problem involved in corrosion and algae control. The speaker discussed two general types of algicides: those which poison and those which smother the algae. In discussing incrustations he explained at some length about the relative advantages in the use of phosphates colloids and acids, as well as zeolite and ion exchange treatment.

We were glad to have R. A O'Neill of Corpus Christi in attendance. He made many helpful statements during the question period and then regaled the members with an account of his experiences on a recent trip to Canada.

At the second meeting of the month the arrival of the 1949 Operating Data Books was announced and they were distributed during roll-call to the members present.

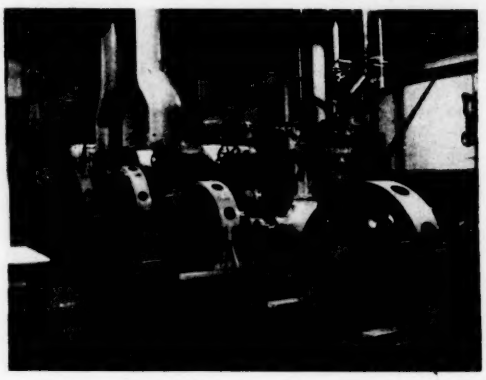
The special speaker of the evening was A. C Speer of Johns-Manville. Mr. Speer briefly outlined the development of mineral insulations and their advantages for high and low temperature applications, and the problems of heat control and vapor seal. There followed the showing of two excellent films on "Heat and Its Control" and the "Story of Transite Pipe." During the intermission Mr. Speer was called on for additional information which evidenced a very considerable interest and appreciation of those present.

San Francisco

By Andy Hope

On August 24, about 100 people assembled at the Golden State Co. Ltd. Plant to take part in our Annual Ladies' Night at the invitations of District Manager J. Jensen, Supervising Engineer Bert McKenna and Chief Engineer Joe Scattini. We first toured the modern milk plant that processes about 12,000 gallons of milk per day for the San Francisco Area, the ultra-modern ice cream plant (largest in the West) that produces 20,000 gallons of ice cream on an average day to supply Northern California with wholesome, nourishing frozen delicacies and then the supermodern Engine Room (recently redecorated in modern pastels) where the compressors have a refrigerating capacity of about 500 Tons at low temperatures in a combination of single stage and booster systems.

We then were entertained in the Assembly Room by Frankie Alberts, All-American football player and present quarterback of the San Francisco 49ers, the finest professional football team in the country. Mr. Alberts presented a technicolor movie showing highlights of last year's 49ers games and supplemented them with explanations of the technique involved in the most important plays at the same time he re-run the scenes in slow motion.



A portion of the Golden State plant inspected by San Francisco Chapter. The two stage section of the engine room—second stage compressors in foreground, first stage to rear. Plant capacity is 500 tons refrigeration.

Refreshments consisting of ice cream in sliced, sundae and Eskimo Pie form, milk, chocolate and orange drink were provided by the Golden State Co. and a most enjoyable and informative evening was had by all who attended for which credit must be given to hard working Entertainment Committee Chairman Bert McKenna who in addition to being a Past President of California Chapter No. 1 is a National Director of the NAPRE and is a living example of the truth of the adage that says "If you want a job well done—give it to a busy man."

New Orleans

By Frank Gillio

The guest speaker of the evening at our meeting of August 10 held at the Roosevelt Hotel was C. W. Lane, Application Engineer of the York Corp. The subject covered complete air conditioning maintenance. Mr. Lane answered all questions which covered pumping down, purging, superheat, solenoid valves, dampness, filters and proper operating pressures for F-12 Thermostatic Expansion Valves. This was a lively meeting, considerable information was obtained and was well appreciated by the members and guests present. At the conclusion Mr. Lane was given a

rising vote of thanks for the manner in which he delivered this interesting and educational lecture.

A motion picture from the U. S. Engineers covering flood protection along the mighty Father of Waters was shown at our meeting of August 24 and was well received by the attendants.

One of the original organizers of the chapter, E. K Strahan, was welcomed back into the fold and was presented with an honorary membership for the year 1949. J. M. Speed, also one of the old-timers, made the presentation and reviewed the work that Mr. Strahan had done for the chapter since its organization in the year 1923. Mr. Strahan thanked Mr. Speed for his kind words and also the members for conferring this honor upon him. Joseph S. Coglaiti connected with the Freeport Sulphur Co. was accepted as a member.

Tacoma

By C. W. E. JOHNSON

The 1949 Operating Data Book was reviewed by Otto Stolz, Chairman of the Educational Committee who stated he would use a number of the questions and answers for educational purposes at future meetings. Bob Slater gave an interesting report of a combination absorption refrigerating machine and a Belt-Ice machine that is being installed at La Push, Wash., to furnish ice for fish boats. Because of its remote location ice delivered is very costly, averaging about $12. per ton. With the absorption machine Bob figured that the ice could be made for one dollar per ton exclusive of labor which is very nominal. He stated that quite a number of small absorption machines are being installed in Alaska where power costs are high or power is not available.

Also shown was descriptive literature on four cube ice makers. They all seemed quite complicated and will undoubtedly need a lot of maintenance to keep them operating; recirculating the same water over and over again is another objectionable feature, and a number of health authorities are concerned about contamination.

The chapter members have taken several field trips this year one to the Port of Tacoma's Cold Storage Warehouse and one to the Frye Packing Co. of Seattle. Both of these trips were very interesting and educational.

Fresno

By K. W. FINDLEY

The regular meeting was held in the office of the Pacific Fruit Express Co. ice plant and we were pleased to have a number of visitors in attendance. Messrs. McMath and Barre of the Pacific Gas and Electric Co., gave an illustrated lecture on illumination. With motion pictures they illustrated the processes of manufacturing the different electric lamps. Then they discussed the shades of color which various types of lamps will produce and how this affects the color appearance of materials being illuminated.

Everyone enjoyed the interesting discussion and a number of questions were answered. At the conclusion of the meeting refreshments were served.

A dinner for the members and wives will feature the next regular meeting of the chapter.

British Correspondent Corrects Statement re Diet

TO THE EDITOR:

The interesting article by W. R. Woolrich in the August issue of your Journal contained some statements regarding British diet which astonished me, as they would most readers in this country.

He says, ". . . and may even avoid eating foods that they consider 'too fresh for healthful consumption' ". I know of no commodity which is considered too fresh to eat other than Gorgonzola cheese, which is allowed to ripen. Very little of this is eaten here however. He then goes on to say that for breakfast "most Britishers have smoked kipper several days each week." On the contrary I know of no family which does this. It is quite an ordeal to eat present-day salty, pseudo-cured "kippers", and in common with most Britishers I only eat them as a last recourse. It is quite two months since I ate one. The Britisher's breakfast, if he could get it, would be egg and bacon.

The price of a domestic refrigerator in Britain definitely places it, unfortunately among the "luxury" goods. I would not like your readers to believe that we like our food any less fresh than anyone else; our attitude is, too, the "fresher the better", though ours is not so fresh.

The above however does not detract from Mr. Woolrich's otherwise excellent article, which is very generous to we Britishers.

CHAS. W. WHITMORE
South Harrow
Middlesex, England

Ice Concern Sets Safety Record

DURING the recent cantaloupe deal, which required icing of more than 5,000 refrigerator cars, Crystal Ice & Cold Storage Co., Phoenix, Ariz., set the best safety record for car icing in its 36-year history. G. V. Smathers, safety director for the company's six plants, three in Phoenix, one each in Glendale, Mesa and Chandler, reported that some 300 employees worked a total of 82,829 man-hours during July, with only two accidents connected with car icing.

For the period January 1 to July 31, 1949, Smathers stated that the overall company safety record had been improved, with only 19 lost time accidents for the 432,091 man-hours, as compared to 32 such mishaps in 437,030 man-hours during the corresponding period in 1948.

Howard Green, Crystal Ice vice president, said: "Mr. Smathers and every employee of Crystal Ice deserves credit for the low accident rate this firm enjoys. For many years we have stressed the importance of safety, both in our manufacturing process and on the highways. I speak for all of our drivers and dealers when I say that we are convinced that courtesy on the road pays off in safety dividends."

The local firm has a fleet of 136 trucks and cars, with 68 driver-dealers and an average monthly payroll of 190 employees. Crystal Ice, a subsidiary of City Products Corp., Chicago, is the only company in the Valley of the Sun that ices cars for shipment of cantaloupes.

Ice Cream Sales

AN ANALYSIS of ice cream sales in the United States and Canada in 1948 compared with 1947 shows that sales declined from the 1946 peak. The survey was made by the Department of Statistics and Accounting of the International Association of Ice Cream Manufacturers.

The report shows total sales of 300,837,432 gallons in 1948 compared to 329,655,889 in 1947. Each month showed a decrease except November in which there was an increase of 5.39 per cent. October however showed the largest decrease of 21.56 per cent. Factors affecting the sales of ice cream are listed as disposable income, average temperatures, and the price.

Ice Plant Adds Personnel

APPROXIMATELY 60 laborers and several clerks are being added to the personnel at the Pacific Fruit Express ice plant in Laramie, Wyo., as a result of non-operating employees of the Union Pacific railroad going on a 40-hour week, according to Homer Whitlock, superintendent of the ice plant.

Refrigerated Warehousing Industry

NEWS • ARTICLES • ANNOUNCEMENTS

NATIONAL ASSOCIATION of REFRIGERATED WAREHOUSES

Division of American Warehousemen's Association

Executive Offices:
Tower Building, Washington 5, D. C.

Secretary, W. M. O'Keefe
Executive Vice-pres., Wm. Dalton

President, Arthur N. Otis
New York, N. Y

Vice-president, Fred F. Alford
Dallas, Tex.

Treasurer, J. L. Gagini
Omaha, Nebr.

"Official Call" for Annual AWA Convention at Chicago Jan. 30—Feb. 2

MEMBERS of the American Warehousemen's Association have received the "Official Call" for their annual convention to be held at the Edgewater Beach Hotel, Chicago, Ill., January 30—February 2, 1950, from their General President, Clem D. Johnston of Roanoke, Va. In urging AWA members to get their reservations in early, President Johnston reminded them that "the Edgewater Beach is a big hotel, that the AWA has become a big Association and even in former years there has been some overflow."

In setting the stage for a preview of what is to occur in Chicago, the AWA head reminded members that they have many things to discuss and which are extremely important to their industry in the light of present-day circumstances and developments in the warehousing field. "Basic things like operating costs and operating methods, new developments, the outlook for business, government competition, proper rating procedures—these and a score of other topics require reappraisal in the light of today's drastically changed conditions", Mr. Johnston declared.

As is customary in AWA, its two component Divisions, the Merchandise Division and the National Association of Refrigerated Warehouses, Inc., will meet jointly at the start and at the end of the three days' sessions, breaking up into divisional sessions for the greater part of that period.

President Johnston also announced the appointment of a Convention Committee of Chicago warehousemen, headed by Co-Chairman A. F. Winston and Ward Castle. Other committee members are: W. C. Baker, F. D. Bateman and S. T. Heffner.

Warehousing Industry Survey Shows Increased Labor Costs

ACCORDING to officials of the American Warehousemen's Association, the industry is paying operational wages at an all-time high figure. This condition exists at a time when actual income is at a low figure—completely out of proportion to present-day operating costs.

In commenting on the situation, one official of the Association declared, "we seldom remember that wages, which in most cases have doubled in the last 15 years and in many cases rightly so, are nonetheless the principal factor in the cost of distribution which appears large unless all the necessary steps to put the product in the hands of the consumer, either Army or civilian, are considered." The official emphasized that "to do their part, American warehousemen have invested, and are investing, substantial additional sums of money in machinery and equipment for handling in unit loads and on pallets to cut down, or at least prevent further increases in handling costs at the stop-off point between producer and consumer."

In line with this statement it was pointed out that practically all increases in costs in this phase of distribution have been made in "handling" rather than "storing" to help alleviate pay roll increases.

Survey by NARW Reveals Employment in Cold Storage Industry

A SURVEY just completed by the National Association of Refrigerated Warehouses reveals that the public refrigerated warehousing industry employs approximately 20,360. Of this number, approximately 14,000 are employed by NARW members. The survey revealed further that 68.5 per cent of all the public general refrigerated warehouses in the U. S. are members of NARW and that these NARW members operate approximately 334,000,000 cubic feet of storage space, or 80.7 per cent of the total.

NARW is constantly representing a larger and larger segment of the public refrigerated warehousing industry through its expanding membership. Today, with membership at an all-time high, its members operate a larger percentage of the total space than ever before.

New Members

NEW applications for membership in the National Association of Refrigerated Warehouses have been received from the following: Marlynn Cold Storage & Warehouse Corp., Miami, Fla.; Florida Quick Freeze & Cold Storage Co., Miami, Fla.; Continental Freezers, Inc., Lafayette, Ind.

Great Lakes Chapter Meets

THE first meeting of the 1949-50 year of the Great Lakes Chapter of the National Association of Refrigerated Warehouses was held at the Grand Hotel, Mackinac Island, Michigan, August 19-20.

The meeting opened with a discussion of the Cincinnati warehouse loading and unloading problems in connection with the labor situation in that city.

A. F. Winston, co-chairman of the AWA Convention Program Committee, reported on its activities and a discussion of possible program subjects ensued. Suggested topics included operation costs, labor, future storage demand, Government storage programs, pitfalls of multi-storied mechanization, claims, research, legislation, etc.

A discussion of the government's price support program on turkeys brought out the fact that very probably a considerable portion of the turkeys grown in the western states would go into storage in west coast warehouses. This was attributed to the fact that under the support program the government is offering only 2½ cents per pound over Zone 1 for turkeys delivered to the eastern coast, whereas in actuality it would cost the owner 4.08 cents per pound gross weight.

In discussing legislative matters, all members were urged to get acquainted with their national and state senators and congressmen and to contact them frequently on matters affecting the industry.

A report on current labor trends stressed the need for cooperation between the merchandise and refrigerated warehouses with reference to negotiating union contracts. It was pointed out that fringe benefits, which are now entering the labor bargaining picture, are equivalent to approximately 12½ per cent of the pay roll, as reported by the Employers Association following a recent survey.

Earle Hesse of Chicago reported on the USDA monthly cold storage report and requested that warehousemen report their figures promptly and accurately. The principal pitfall in the occupancy report is that all private and semi-private warehouses do not report their percentage of occupancy, although most report their tonnage holdings. Delays or failure to report monthly by members is a serious default, he said. There was some discussion of the basis to be used in reporting occupancy, and it was agreed that both visual observance of space and a check-up of volume of tonnage be used in computing this figure.

Discussion of future storage demand showed an optimistic picture. The Government's hog purchase program is expected to create a demand for space for this product. It was also explained that there would be a large demand for turkey storage this year. It was also brought out that cheese purchases by foreign countries had been reduced and that the transit charge of ¾ cents to eastern points from Northern Wisconsin was lower than at Milwaukee and Chicago, thereby forcing storage of cheese at the reduction point.

In treating the subject of mechanical handling, it was brought out that a vital point to consider is that elevator minimums of 6,000 lbs. capacity are necessary as a safety factor. It was also pointed out that a 15 to 20 per cent space loss is to be expected under complete mechanization. The consensus of opinion was that mechanization contributes to economy of operation but is limited to something less than total plant palletization.

In some cases it has been possible to obtain the assistance and cooperation of customers in ordering on the unit pallet load basis. This practice has proved of economical advantage to the warehouse and to the customer. It was also generally agreed that any packaged product would lend itself to palletizing. Long storage hold packaged commodities might present the question of economy of palletizing, but average hold was disclosed to be less than three months.

North Atlantic Chapter Meeting

FIFTY members and guests attended the Fall Meeting of the North Atlantic Chapter of the National Association of Refrigerated Warehouses, held at the Hotel Kimball and the Springfield Country Club, Springfield, Mass., September 8 and 9. The principal speakers at the meetings were Dr. Bernard E. Proctor, Director of the Food Technology Laboratories, Massachusetts Institute of Technology, and Prof. Sumner R. Parker, University of Massachusetts.

"Cold Magic" was the subject of Dr. Proctor's address, and he discussed many new and amazing uses of refrigeration in the fields of atomic energy, medicine, surgery, chemistry and horticulture, as well as current developments in food preservation. While many of these items are not as yet applicable to commercial cold storage, the indicated future possibilities of totally new and unprecedented applications were challenging to the imagination.

Prof. Parker, who is also Executive Officer of the Produce and Marketing Association of Massachusetts, discussed the Brannan Plan—explaining in detail some of the more controversial points in the proposed legislation.

Jerry Johnson, Chairman of the Legislative Committee of the National Association of Refrigerated Warehouses, discussed items of proposed legislation in which the industry is concerned. Several other subjects of interest to the Chapter and the industry came up for discussion.

Martin Larsen, Atlantic States Warehouse & Cold Storage Corp., Springfield, Mass., was chairman of the Program Committee in charge of the meeting, which was presided over by the chairman of the chapter, Harold C. Emerson, Cumberland Warehouse Corporation, Bridgeton, N. J.

Union Storage Company Liquidates

ANNOUNCEMENT has been made that the Union Storage Co., Pittsburgh, Pa., establishd in 1880 and a charter member of the American Warehousemen's Association, will dissolve voluntarily and cease operations October 31, 1949. This decision has been made because its properties have been appropriated as part of the city's Point Park Improvement Project.

Thus will pass a very prominent establishment of many year's standing, whose officers and personnel, past and present, including Samuel Bailey, Jr., C. L. Criss, John L. Porter, G. F. Nieman, C. L. Schaub, and Miss Mary Hill, have rendered valuable service to the refrigerated warehousing industry.

The announcement by President C. L. Schaub expresses regret that circumstances take one of the oldest cold storage companies in the country out of business, but they look back with pride and appreciate their many friends both in the industry and the publications pertaining to it.

Pear Storage Space Wanted

THE Oregon-Washington-California-Pear Bureau is anxious to locate cold storage space in several cities throughout the country for use of their grower-members according to the National Association of Refrigerated Warehouses. This space would probably constitute storage of from one to four or five cars at a time, at various points.

These pear growers are desirous of having, in connection with approximately 32 F. storage, some smaller space available to hold possibly a half a carload at a time. This space is to be used for ripening, and requires a temperature of from 60 to 70 F, with a 75-85 relative humidity. It is understood that pears readily assimilate moisture from any point in the room.

Distribution Cost Study of Stored Apples

OF THE Chicago consumer's dollar spent for Delicious apples grown in Washington State during the 1947-48 season nearly 24 cents went for washing, grading, packing, cold-storage and other services at the packing plant, 14 cents went for transportation from the packing plant to Chicago, and 36 cents was for wholesaling and retailing after the apples reached Chicago, the Bureau of Agricultural Economics, U. S. Dept. of Agriculture reports.

The 26 cents left to the Washington apple farmer as his part of the consumer's dollar was based on the average price received at the packing house door for Delicious apples shipped to Chicago. Out of his share, the farmer had to pay all his costs of production, and costs of harvesting and hauling apples to the packing plant. This information is from BAE's Marketing and Transportation Situation for August, which contains a preliminary report of a survey conducted by BAE on "Farm-to-Retail Margins for Washington Delicious Apples Marketed in Chicago." The study was financed under the Research and Marketing Act.

The report gives returns to grower **per box** as well as his portion of the consumer's dollar. Services at the packing plant or shipping point cost an average of $1.21 per box but the charges ranged from a low of $1.04 to a high of $1.42 per box. It is pointed out that most of the work in the study was given to these packing plant charges. Freight charges took 73 cents a box, auction charges 9 cents, and wholesalers and retailers got an average of $1.74 per box. The apples retailed in Chicago at an ayerage price of $5.13 per box. This left the Washington apple grower $1.36 per box for Delicious apples sold in Chicago.

The $1.21 per box marketing charge at the packing plant was broken down as follows: packing 46 cents; box and lid, 38 cents; warehousing and storage, 21 cents; handling and selling, 13 cents; and miscellaneous charges 3 cents a box. Of this miscellaneous charge, 1½ cents a box went to the Washington State Apple Advertising Commission for advertising and related expenses, 9/10 of a cent for Federal-State Inspection, 1/10 of a cent for discounting drafts at the bank and nearly half a cent for other expenses.

Report on General Economic Situation

FOLLOWING a series of conferences with businessmen, public officials and labor leaders in the East, Central East and Southeastern areas on general economic conditions, an interim report has been filed by Secretary of Commerce, Charles Sawyer. Among the recommendations made to Mr. Sawyer by business groups and others were:

1. Further reductions and economies in government expenditures through reorganization of Federal Agencies and otherwise.

2. Repeal of wartime excise taxes; liberalization of depreciation allowances in connection with income taxes; and exemption of the first $25,000 of corporate business income from taxation.

3. No acceleration in the general level of federal public works beyond that now contemplated.

4. Increase of unemployment compensation and availability to families in distress of some of the surplus agricultural products purchased and held by the Federal government.

Among businessmen, according to Mr. Sawyer, there also was unanimous agreement that a further round of wage increases at this time would have a serious depressing effect on business, and would make price reductions practically impossible.

Prescott Writes History of Food Technologists Institute

A HISTORY of the Institute of Food Technologists is being written by Dr. Samuel C. Prescott, emeritus professor and former dean of science of Massachusetts Institute of Technology as well as the first president of the Institute of Food Technologists, and chairman of the Board of the Refrigeration Research Foundation. He is being assisted in this work by E. S. Stateler, associate editor of Food Industries and a past chairman of the Chicago Section of IFT.

Dr. S. C. Prescott

Dr. Prescott, generally recognized as the "father of food technology," was responsible for the first Food Technology Conference held at MIT in 1937. This conference, coming 15 years after "Boston Tech" first offered a course in food technology under his leadership, provided the nucleus of food experts who founded the Institute of Food Technologists for their first annual conference in Chicago in 1940. As a pioneering food technologist, one of Dr. Prescott's outstanding contributions made in 1896 was the establishment of the fact that chemical spoilage in canned foods was due to the action of bacteria and other microorganisms.

Dr. Prescott will outline the factors and forces that led to the realization of his dream for recognition of food technology as a profession. The ever increasing reliance of the world's oldest and largest business—the processing, handling, and distribution of food—upon science and its applications has been emphasized and firmly established by the nation's experiences in the two World Wars of the 20th Century, not to mention the general public's preferences for processed and prepared foods.

The Chicago Section of the Institute established the Nicholas Appert Medal Award for presentation to outstanding food technologists, which award was conferred upon Dr. Prescott in 1943 as its second recipient. In its desire to commemorate the tenth annual IFT conference, the officers and executive committee of this first chartered regional section decided that a history of the Institute would prove a fitting tribute to its rapid growth from a membership of approximately 700 to nearly 3000 in its first ten years of existence, and especially so, under the authorship of IFT's official "father," Dr. Prescott.

Mr. Stateler, former secretary and past chairman of the Chicago Section will trace the contributions of that Section. He is well fitted to do this, having been one of the founders of the Section and a loyal supporter of the Institute.

This record of the Institute of Food Technologists and its Chicago Section will be published in a brochure for presentation to all who attend the IFT Decennial Conference to be held in Chicago in May, 1950.

Poultry Industry Plans Historical Exhibit

A FEATURE of the Mid-Century Fact Finding Conference to be held by the Institute of American Poultry Industries at Kansas City next February 11-14, will be an historical exhibit of how the industry did things fifty years ago. The Institute has appointed a special committee to dig into poultry archives and get the exhibit material together.

California Revises Cold Storage Act

THE 1949 session of the California Legislature amended the California Cold Storage Act, consolidating and revising the law relating to cold storage, including refrigerated warehouses and food kept or preserved therein and repealing certain acts and parts of acts. The amended portions of the Act comprise the following chief provisions:

28111. "Cold Storage" means a place artificially refrigerated to a temperature above zero of 45 degrees Fahrenheit or below. It does not include any such place where food which is privately owned and not held for resale is stored inside of lockers or compartments which are not more than fifteen cubic feet in capacity, and which lockers or compartments are leased to private individuals for their exclusive use.

28112. "Cold Stored" means the keeping of articles of food in cold storage for a period exceeding ten days.

28113. "Article of food" means any article of food used for human consumption. It includes fresh meat and fresh meat products (except in process of manufacture), fresh and dried fruit or vegetables, fish, shellfish, game, poultry, eggs, butter, and cheese, but not malt beverages.

28117. The term "locker plant" as used in this chapter shall mean any building or portion thereof which is artificially cooled to or below a temperature above zero of 45 degrees Fahrenheit and used exclusively for the storage of any article of food for the sole use of the storer, and which article or articles of food are not for resale. If any article or articles of food stored in locker plants are for resale and/or to be used for manufacturing purposes, said locker plant is subject to the license provisions of this chapter and all sections thereof.

28120. Any person desiring to operate a cold storage or refrigerating warehouse for storing articles of food shall make application in writing to the board for a license for that purpose, stating the location of his plant —or plants. For the purpose of securing the proper enforcement of this chapter, each separate building or structure, physically separated from another by a through street or highway open to public use, shall be considered as a separate cold storage or refrigerating warehouse or plant. Separate application for a license shall be made for each plant.

28126. For each cold storage or refrigerating warehouse or plant operated by an applicant for a license, the fee is fifty dollars ($50).

28130. If any place or portion of a place for which a license is issued is deemed by the board to be in an unsanitary condition, the board shall notify the licensee of the condition.

28131. Upon failure of the licensee to correct the situation within a designated time the board shall prohibit the licensee from using the place of specified portion until such time as it is restored to a sanitary condition.

28132. Every licensee shall keep an accurate record of receipts and withdrawals of articles of food, and the board shall have free access to these records at any time.

28133. When requested by the board or an agent thereof, any licensee shall submit a report setting forth in itemized particulars the quality of food products held by him in cold storage.

28140. No storer shall place in cold storage any article of food whose keeping qualities have been impaired by disease, taint, or deterioration, or which has not been slaughtered, handled, and prepared for storage in accordance with the pure and sanitary food laws and such rules and regulations as may be prescribed by the board for the sanitary preparation of food products for cold storage.

28141. Any article of food intended for use other than human consumption shall, before being cold stored, be marked by the owner in accordance with forms prescribed by the board in such a way as to indicate plainly that the article is not to be sold for human food.

28142. The container in which an article of food is packed or the article itself when deposited in cold storage, shall be marked plainly with the lot number covering that particular lot of articles of food indicated and recorded on the records maintained on the premises.

28143. The board shall inspect and supervise all cold storage or refrigerating warehouses, and make such inspection of the entry of articles of food therein as it deems necessary to secure the proper enforcement of this chapter.

28144. The members of the board and its duly authorized employees shall be permitted access to cold storage or refrigerating warehouses at all reasonable times for purposes of inspection and enforcing the provisions of this chapter.

28145. The board may also appoint at such salary as it may designate, any person it deems qualified to make any inspection required by this chapter.

28146. No person shall keep any article of food in cold storage for more than twelve calendar months, except with the consent of the board. Thirty days prior to the expiration of the 12-month period, the licensee shall send notice to the board advising them of this fact. Duplicate notice shall be sent to the owner of the food.

28147. The board shall, upon application, grant permission to extend the period of storage beyond 12 months for a particular consignment of goods, if the goods in question are found, upon examination, to be in proper condition for further storage at the end of 12 months. The length of time for which further storage is allowed shall be specified in the order granting the permission.

28149. For the purpose of determining whether or not food locker plants come under the provision of this act, the operators or owners of all such frozen food locker plants shall make available, upon request to any agent of the State Department of Public Health, the names and addresses of any and all persons, firms, or corporations renting, leasing or occupying such lockers or compartments.

28150. Unless otherwise permitted by this article, it is unlawful to represent or advertise as fresh goods articles of food which have been placed in cold storage.

28152. It is unlawful to return to cold storage any article of food that has once been released from such storage and placed on the market for sale to consumers. However, nothing in this section prevents the transfer of goods from one cold storage or refrigerating warehouse to another, if the transfer is not made for the purpose of evading any provision of this chapter.

Bailey Issues Statement

Commenting on this legislation, the Pacific States Cold Storage Warehousemen's Association, L. A. Bailey, executive manager, has issued a statement as follows:

This revised copy of this important law . . . regulating the sanitary aspects of commercial refrigerating warehousing . . . is the culmination of plans we have had in mind for several years for the purpose of repealing or amending the objectionable, unenforceable or impracticable provisions enacted in the year 1913 which have since become antiquated or harmful and of no public benefit.

The revised Act became effective October 1, 1949. To accomplish the 1949 amendments has required a considerable amount of our constant attention during the recent session of our Legislature. We have had the extreme cooperation of Mr. Milton P. Duffy, Chief, Bureau of Foods and Drugs, State Department of Public Health and in turn we have cooperated with Mr. Duffy in the enactment of certain new provisions which he requested for the purpose of clarification designed to equally regulate locker plants which engaged in commercial storage practices.

Drawing to your attention the repeal of the following provisions of the 1947 Act, you can readily distinguish what has been accomplished by the 1949 amendments to remove provisions which if enforced would have been injurious to your operations or to the trade using your services:

Sec. 28133: "Every licensee shall submit a quarterly report to the board, setting forth in itemized particulars the quantity of food products held by him in cold storage. The reports shall be filed on or before the twenty-fifth day of January, April, July and October of each year, and each shall show the conditions existing on the first day of the month in which it is filed." (NOTE: This section was amended to simply require filing reports of food products in cold storage upon the request of the Board.)

Sec. 28134 (repealed): "The board may require the making of reports at more frequent intervals than quarterly, if in its judgment more frequent reports are needed for the proper enforcement of this chapter, or for any other reason affecting the public welfare."

Sec. 28142: "The container in which an article of food is packed or the article itself, when deposited in cold storage, shall be marked plainly with the date of receipt, and, when removed from cold storage, with the date of removal, in accordance with such rules and forms as may be prescribed by the board." (NOTE: This section was amended to simply require the lot number to be plainly marked on the package or article.")

Sec. 28149 (repealed): "Unless otherwise permitted by this article, it is unlawful to sell, or to offer or expose for sale, uncooked articles of food which have been cold stored without notifying persons purchasing, or intending to purchase, the same that they have been kept in cold storage by the display, in a conspicuous place and upon the articles of food, of a sign marked 'These are cold stored goods', in type at least two inches high." (NOTE: Re-enacted Sec. 28149 relates only to locker plants.)

Sec. 28151 (repealed): "The board may for the purpose of securing the proper enforcement of this chapter establish quality grades or standards to govern the sale of articles of food which have been cold stored. In that event it shall be unlawful to sell, or to offer or expose for sale, any such uncooked articles of food which have been cold stored without notifying, by suitable sign or label, persons purchasing or intending to purchase the food of the exact grade or quality of such food according to the standards prescribed by the board."

There were certain changes in this law which we desired but which were objectionable to the Board for reasons of enforcement. In the interest of prevailing in the enactment of the more important amendments these desires were submerged. They included:

Sec. 28111. To exclude from the act leased lockers or compartments up to 25 cubic feet rather than the 15 cubic feet adopted.

Sec. 28112. To define a cold storage period to be two weeks rather than the 10-day period enacted.

Sec. 28142. To require the marking of the lot number only on representative packages in the lot on each exposed side of the storage pile rather than upon each package or article.

Sec. 28146. To modify the 12 months' storage limitation as to articles of food held in freezers at Zero or below when regulation by the board may set a limitation up to two years.

Sec. 28152. To modify the restriction against the return to cold storage of any article of food once removed from cold storage.

Locker Plants

Certain members of the locker plant industry raised objections to Section 28117 before the Governor. This section was added in the Senate at the request of Mr. Duffy to make it clear that locker plants in which articles of food are stored for "resale," or when to be used for purposes of manufacture, such transactions would be considered to be cold storage and subject to license and regulation within the provisions of the Act. Section 28111 exempts lockers up to 15 cubic feet when leased to individuals for their exclusive use. Section 28116 exempts a refrigerating plant in which food is stored for the exclusive use of the owner or operator of the plant.

By these provisions it seems quite clear that a locker plant operator can engage in the butcher business and display its own meats for "sale" as this would not be a "resale" under Section 28117 in our opinion, and Mr. Duffy states he has no intention to hold otherwise. However, where actual cold storage is performed for others for off-premises resale or processing, such transactions would come within the Act and be subject to license and regulation.

Freezer Space Needed for Pork

THE Shipping and Storage Branch of the United States Department of Agriculture estimates it may need freezer space at 0 F. and below for up to 11,000 cars of hog sides and boxed pork beginning about the middle of September. The purchase program is expected to continue until mid-February with November and December being the peak months. There is no visible outlet for this pork which will probably necessitate a long hold in storage. In preparation for this program, the Department wants information now on the amount and location of freezer space 0 F. and below suitable for up to six months' storage of hog sides and boxed pork which is available now.

Those who are interested in possible business under this program are advised to inform the National Association of Refrigerated Warehouses of the amount of 0 F. and below space they have available. Arrangements have been made with the Department of Agriculture to pass this information along to the Shipping and Storage Branch.

Government Poultry Packaging Project

THE United States Department of Agriculture has set up a Poultry Packaging Committee to: (1) produce and maintain standard specifications for poultry packages and packaging materials; (2) produce publications and educational material pertaining to poultry packages, packaging, handling, storing and similar practices; and (3) recommend research relative to poultry packages, packaging and related operations.

Representing the National Association Refrigerated Warehouses on this committee is J. L. Gagini, vice president, Omaha Cold Storage Co., Omaha, Nebr., and his alternate is H. A. Gross, general manager, Booth Cold Storage Co., St. Louis, Mo. Warehousemen who have any suggestions in relation to packaging of poultry for storage are asked to pass them along to those gentlemen and the NARW office.

Canadian Cold Storage Holdings

THE Dominion Bureau of Statistics of Canada, Agricultural Branch, reports the following commodities held in cold storage on August 1, 1949 as compared with August 1, 1948 and July 1, 1949.

Apples in cold storage on August 1, 1949 amounted to 9,073 bu. as compared with 15,383 bu. August 1, 1948 and 43,491 bu. July 1, 1949.

Frozen fruit holdings in storages and factories August 1, 1949 amounted to 16,735,000 lbs. as compared with 20,344,000 lbs. August 1, 1948 and 14,017,000 lbs. July 1, 1949.

Stocks of frozen vegetables in storages and factories on August 1, 1949 amounted to 4,270,000 lbs. as compared to 5,034,000 lbs. August 1, 1948 and 3,002,000 lbs. July 1, 1949.

Refrigerated Warehousing Industry

Peach Refrigeration Pays Dividends

By H. A. Cardinell
Associate Professor of Horticulture
Michigan State College, Lansing

IN EARLIER years when the price of peaches was rather low, the growers and shippers were not too much concerned with the amount of spoilage that occurred during the normal course of transportation and distribution to the consumer. During the last five years, however, 10 to 50 per cent spoilage on some shipments costing $3.00 to $3.00 per bushel f.o.b. shipping point presents a serious situation to the industry.

Growers and buyers of peaches know that the more distant the market the longer the storage period while the fruit is in transit, and the higher the temperature the "greener" the fruit must be and the greater will be the loss from spoilage.

Noon hour at Coloma Fruit Exchange, Coloma, Mich. 13,888 bu. of peaches were Stericooled in this unit last season. This machine was ice fired using 246,000 lbs. of water ice. Eighty-five degree peaches were reduced to 45 F. in fifteen minutes, using 17.7 lbs. of ice per bu. of peaches. The cost for ice was 6.1 cents per bushel. Two such units were used in Michigan in 1948 in which 22,680 bu. of peaches were Stericooled using 407,450 lbs. of water ice.

In a recent report of peach shipments unloaded and inspected in New York City during eight consecutive years, 1129 carlots, or 50 per cent, showed an average of 3.8 per cent decayed fruit. Brown rot caused 49 per cent of the spoilage, and 39 per cent was due to black mold or Rhizopus. Of the 2258 carlots of peaches inspected, those from California showed the highest percentage of decay (10 per cent), due no doubt to the eight or 10 days the fruit was in transit.

Result of Nearness to Market

The report proves that nearness to market is a measurable asset to shippers and buyers. Peaches from Arkansas showed 2.6 per cent decay, Georgia peaches had 1.9 per cent decay, whereas short-haul fruit from Maryland averaged only 0.4 per cent spoilage and New York State averaged only 0.2 per cent decay.

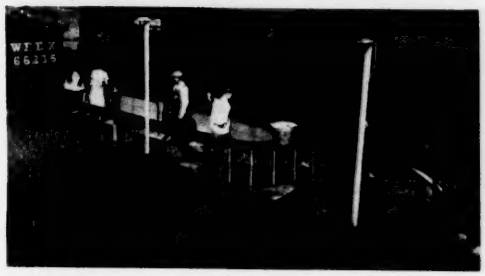
Michigan had too few shipments to New York City to be included in the study but very likely Michigan peaches could be expected to place somewhere between Ohio's 1.0 per cent and Illinois' 1.3 per cent spoilage.

If one considers all the factors involved in endeavoring to grow, pack, treat, transport, and market perfect peaches, 80 per cent of the responsibility rests with the producer. The grower is the only person who can control variety, yield, fruit size, and pests, and segregate fruit of like maturity, free from bruises.

The packing operation accounts for about 10 per cent of the market quality. The final 10 per cent is the responsibility of the buyer in the way of transportation, care in handling, and the temperature maintained within the fruit from the time it is loaded until it is consumed or processed.

Why the majority of Midwest peaches are not precooled before or after packing, in fact, are packed warm, and sold warm, continues to be a mystery. For several years most packing houses have been following the practice of blowing sulphur dust over peaches as they are being brushed.

The Michigan Experiment Station in co-operation with several agencies and packing houses has attempted to compare the relative value of brusher-dusting and the newer method of hydrocooling with a liquid germicide, such as the chlorine-type compound used in patented device called the "Stericooler", manufactured by Food Machinery and Chemical Corporation.



This hydro cooler holds 1950 gals. of water. Sized ice is fed into it by an incline elevator shown at the right which passes over the carloading conveyor. The ice maintains the water in the cooler at 32 F. and a germicide "Hypo-Clor" was used in the ice water to reduce market spoilage. A label on each package called attention to the trade that the contents had been treated with ice water and a safe germicide to prolong market life.

Data obtained last summer show that commercially packed peaches, regardless of packing house treatment with sulphur or chlorine and with or without hydrocooling, showed only two per cent decay after 12 days in cold storage. But "Stericooling" gave the best protection for 144 hours at "store" temperatures of 75 to 80 F., or 19 days after harvest.

Dusting peaches with sulphur during the brushing operation ranked second in control of spoilage. Fruit held in storage 12 days showed 11 per cent decay 24 hours after removal from storage, 38 per cent decay in 48 hours, 42 per cent in 96 hours, and 71 per cent in 144 hours.

Apparently packing house treatment of peaches is beneficial, but only when the fruit is held under proper refrigeration can spoilage be kept to a minimum.

Investigation Compares Methods

Through the cooperation of Dr. C. Guin Barr of the John Bean Division, Food Machinery and Chemical Corporation, and the Michigan Fruit exchanges at Hartford, Coloma, Millburg, Watervliet, and Sodus, it was possible to trace railroad refrigerator car shipments from Benton Harbor, Mich., to New York City. The Railroad Perishable Inspection Agency of New York made possible inspection and comparison of six carlots of peaches "Stericooled" by the Millburg Growers Exchange and the Coloma Fruit Exchange and six carlots of fruit dusted with sulphur at the time of grading. The average time in transit and in inspection was five and one-half days.

The amount of decay was less than one per cent. Three of the cars loaded with 45 F. "Stericooled" fruit showed no decay on the fourth and sixth day after shipping. One of the carlots loaded with warm, sulphur-dusted peaches showed no decay on the fourth day after shipping.

Hydrocooling the fruit before loading it in pre-iced refrigerated railway cars resulted in a saving of ice in transit averaging 4459 pounds per car between Michigan and New York. Loading "Stericooled" peaches saved fan-precooling time, also $15 per car charge for pre-cooling loaded fruit by means of removable fans.

Cold Storage Holdings of Orange Juice

THE national Association of Frozen Food Packers has requested that the holdings of frozen orange juice—straight and concentrate—be shown separately from other fruit juices and purees in the government's monthly cold storage report. Both the National Association of Refrigerated Warehouses and the United States Department of Agriculture have approved of the change, and it will soon be put into effect, according to word received from the National Association of Refrigerated Warehouses.

Construction Proceeds on Lafayette, Ind. Freezer Storage

CONSTRUCTION has been started and is proceeding rapidly on the cold storage building of Continental Freezers, Inc., at Lafayette, Ind. This new 600,000 cu. ft. plant is situated on an extensive industrial tract established just beyond the eastern border of the city. It is adjacent to the arterial highway linking Chicago, Indianapolis and Louisville with connections to all other important cities surrounding. An extension from the Nickel Plate Railroad also runs the length of the plant.

The building has approximate dimensions of 100x350x20 ft. height. A covered dock 16 ft. wide runs the full length of the plant on one side. The storage section of the building is single floor type while the center section designed for office space will have two floors.

Throughout the structure the walls are brick backed up with Haydite concrete blocks and attractive architectural treatment is provided with parapet-type walls extending above the roof line. The insulation will be corkboard applied in the following thicknesses: in walls 6 in., floor 7 in., roof 8 in. The roof is completely supported by columns so that the insulation provides a continuous envelope around the top sides and bottom, pierced only by the columns running through to footings. Insulated casings constructed around the lower portion of the columns are a concrete cylinder filled with vermiculite.

The lower roof slab will be constructed of pre-cast concrete tile. Then the insulation will be applied. Roof waterproofing consists of two courses of roofing felts laid in asphalt topped by two courses of sheet aluminum laid in asphalt.

The column spacing is 43 by 16 ft. to provide wide piling space with little obstruction. This along with large doors and the long, wide dock will permit rapid, convenient handling of the stored goods.

Provisions are made for two blast freezing rooms, and a small processing and work room is provided at cooler temperature. Otherwise the entire storage section is designed for freezer service.

Refrigeration in rooms will be applied by fan driven water defrost units. Forty-three units in all will be employed; each contains two fans driven by 1/6 h.p. motors. The coils in these refrigeration units are designed to operate at a temperature difference of 8 degrees between room air and refrigerant. With this ample provision of surface, it is expected that high relative humidity will be maintained in the storage space.

Refrigeration machinery and connections are being furnished by the Burge Ice Machine Co., Chicago. Principal units are two Baker Refrigeration Corp. 9¼ x 9¼ VSA ammonia compressors directly connected to synchronous motors at 277 rpm. Vertical shell and tube condensers are in two units, one 30 in. diameter and the other 20 in. diameter. An ample supply of cooling water has already been established on the site from wells of moderate depth.

Ken Stepleton, president of Continental Freezers, Inc., is congratulated at the ground breaking ceremony for the new plant by S. C. Rogers, Swift and Co., with whom he originally started in the cold storage business. Observers are Bill Lang, vice president, Tom Gould, president and John Sanders, secretary-treasurer, all of Lafayette Foods, Inc.

The first section of the plant is expected to be in operation shortly after the first of the year A rapid schedule of construction has been established and it is expected that work will be completed shortly thereafter.

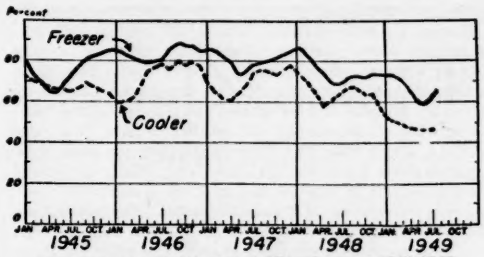
Cold Storage Holdings—Cooler Occupancy Same; Freezers Show Slight Increase

LITTLE change occurred in the occupancy situation for public warehouses during July. Public coolers, which on July 1 were 52 per cent filled, registered the same occupancy on August 1. A 2-point rise in freezer occupancy from 61 on July 1 placed August 1 occupancy at 63 per cent. The July change in both coolers and freezers corresponded to the normal change for this season of the year. August 1 cooler occupancy was 3 points below the lowest previously recorded on August 1, 1940, while August 1 freezer occupancy was 6 points below the previous August low in the same year. Though generally throughout the country space occupancy was relatively low, there were a few comparatively tight areas in certain cities. Space was practically filled in Minneapolis while Nashville, Tennessee, reported an occupancy of nearly 90 per cent.

TABLE I—COLD STORAGE HOLDINGS IN PUBLIC, PRIVATE AND SEMI-PRIVATE WAREHOUSES, APPLE HOUSES AND MEAT PACKING PLANTS (000 LBS.)

	Aug. 1, 1949	July 1, 1949	Aug. 1, 1948	Five-year Average
Meat and meat products, lbs.	544,429	612,391	685,946	670,615
Lard and rendered pork fat, lbs.	97,198	103,890	174,304	166,673
Frozen poultry, lbs.	73,122	74,733	91,186	137,103
Creamery butter, lbs.	136,525	102,701	83,105	111,742
American cheese, lbs.	159,919	140,859	168,809	165,549
Other cheese, lbs.	20,155	19,253	25,068	26,196
Shell eggs, cases	1,957	2,290	5,525	6,921
Frozen eggs, lbs.	169,172	166,582	257,367	279,253
Apples, bu.	168	343	148	.....
Frozen fruits, lbs.	335,316	255,787	340,894	313,236
Frozen vegetables, lbs.	239,249	219,515	214,076	202,628
Frozen fish, lbs.	126,013	114,031	127,474	111,057

net piling space shown in tables 2 and 3 represent space actually reported to USDA on August 1 and temperatures at which it was held as of that date. Warehouses failing to report their space are omitted. There has been no change in the system used for deriving percentage occupancy; consequently, the percentages are comparable.



Occupancy in Refrigerated Warehouses, 1945-1949

Refrigerated warehouses in the Nation held 2.7 billion pounds of foodstuffs on August 1, 167 million pounds more than stocks on hand last month. Stocks in coolers, up 60 million pounds from last month, totaled 1.2 billion pounds on August 1, while freezer-held commodities, at 1.5 billion pounds, reflected a seasonal increase of 107 million pounds. With the exception of fresh pears, dried and evaporated fruits, cheese and dried eggs, all cooler-held items showed seasonal withdrawals. The into-storage movement of freezer items during the month was more than twice the seasonal increase reported this time last year. The volume of meat products withdrawn during the month were more than balanced by the heavy in-movement of frozen fruits and vegetables. These food items, alone ac-

TABLE II—PERCENTAGE OF SPACE OCCUPIED BY PUBLIC COLD STORAGE WAREHOUSES (APPLE HOUSES EXCLUDED)

	Net Piling Space (000 cu. ft.)		Aug. 1, 1949 (%)		July 1, 1948 (%)		Aug. 1, 1948 (%)		5-Year Average (%)	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	2,834	5,033	43	77	45	74	51	57	72	76
Middle Atlantic	40,574	28,663	44	62	43	57	57	69	70	82
East North Central	29,216	27,866	61	61	63	60	78	73	80	79
West North Central	9,885	13,612	69	66	59	64	84	84	84	82
South Atlantic	8,890	5,546	51	72	53	72	72	75	75	83
East South Central	3,602	2,794	68	86	65	84	83	84	86	81
West South Central	6,320	5,813	67	50	65	51	72	66	80	81
Mountain	1,834	2,005	53	62	55	64	72	86	82	87
Pacific	16,659	18,506	42	61	37	59	49	68	59	79
United States	119,814	109,838	52	63	52	61	67	72	74	81

Note should be taken of a change in the system of reporting net piling space in the occupancy tables of this report. Heretofore "net piling space" has been shown as the total available for storage as of the last space survey, October 1, 1947. Those figures are still available. The

TABLE III—PERCENTAGE OF SPACE OCCUPIED BY PRIVATE AND SEMI-PRIVATE REFRIGERATED WAREHOUSES AND MEAT PACKING PLANTS

	Private and Semi-Private Warehouses						Meat Packing Establishments					
	Net Piling Space (000 Cu. Ft.)		Space Occupied—Per Cent Aug. 1, 1949		July 1, 1949		Net Piling Space (000 Cu. Ft.)		Space Occupied Aug. 1, 1949		July 1, 1949	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	1,338	589	49	51	30	51	.....	.....	.....	.....	81	.....
Middle Atlantic	2,551	2,339	34	45	42	40	2,227	440	80	58	72	55
East North Central	3,542	1,555	64	32	66	39	4,789	1,532	84	83	88	86
West North Central	763	2,569	88	79	76	80	20,458	6,935	88	83	86	81
South Atlantic	522	1,716	15	71	19	71	1,055	233	89	99	90	99
East South Central	.....	.....	.....	.....	.....	.....	351	94	82	91	58	83
West South Central	378	87	30	47	30	46	2,525	501	100	100	100	100
Mountain	120	596	86	64	85	24	421	366	100	100	96	98
Pacific	3,898	3,689	30	68	23	62	3,347	692	80	92	92	86
United States	13,112	13,140	45	61	46	56	35,173	10,793	87	84	86	82

NOTE: Blank spaces indicate that insufficient returns were received. The same is true of certain states in other regions including Indiana, Illinois, Missouri Kansas, Arkansas, Louisiana, Oklahoma, Arizona, Utah, Nevada, New Jersey and Michigan.

counted for approximately 100 million pounds or 93 per cent of the total increase in freezer stocks.

Some 80 million pounds of frozen fruits were moved into storage during July, placing August 1 stocks at 335 million pounds. This movement was a third greater than last year's July 60 million pound movement. August 1 stocks, however, were still 6 million pounds below last year's level. The greatest increase occurred in holdings of frozen cherries which rose from 18 million pounds on July 1 to 70 million pounds on August 1. Frozen vegetables increased 19 million pounds to 239 million pounds on August 1—25 million pounds above last year's stocks. Lima bean stocks were twice those of a year ago and snap beans three times as great, whereas frozen peas in storage were slightly below the 1948 level.

August 1 stocks of butter totaled 137 million pounds—25 million above average. Other dairy products in store August 1 were below average. Cream stocks totaled 34 million pounds compared with an average in storage of 69 million pounds. Cheese totaled 181 million pounds compared with an average of 194 million pounds. Shell egg holdings, which have been abnormally low for some time, began to move out of storage during July. Only 2.1 million cases were left in storage August 1 compared with average August holdings of 6.9 million cases. The 169 million pounds of frozen eggs were 110 million below average. The total case equivalent of dried, frozen, and shell eggs was 5 million cases less than average. Frozen poultry moved contra-seasonally out of storage with a net withdrawal of 2 million pounds during July.

August 1 holdings of meats and meat products totaled 544 million pounds, a decrease of 68 million pounds since last month. Last year this time, total meats in storage amounted to 686 million pounds. Beef in storage, at 68 million pounds, was a little more than half the average August 1 holdings. Frozen pork stocks were reduced by 36 million pounds during July which was about the average reduction for this time of year, but well below the withdrawals last year. This withdrawal of frozen pork together with the reduction of 18 million pounds of other pork left total pork stocks at 365 million pounds. This time last year, 508 million pounds of pork were in storage. Lard and rendered pork stocks were 70 million pounds below the average August 1 holdings.

Fishery products, frozen and cured, totaled 154 million pounds on August 1. A net into-storage movement of 2 million pounds of cured fishery products and 12 million pounds of frozen fishery products raised the total on hand to 28 and 126 million pounds, respectively. Significant increases in storage stocks of fillets (miscellaneous), salmon, and whiting largely contributed to the 103 million pounds of frozen salt-water species in storage. Fresh-water species totaled 8 million pounds on August 1, while frozen shellfish amounted to 15 million pounds.

Storage Outlook

With storage occupancy the lowest on record for August 1, it would appear that little difficulty should be encountered by storers wishing to locate space during the coming fall. Coolers, with an occupancy of 52 per cent on August 1, must assist this year in caring for one of the largest apple-pear crops on record. Many of the apples will move into specialized apple houses: however, so, with a few exceptions in spotted areas such as the New England states possibly New Jersey and certain parts of the West North Central region those seeking apple storage space should find no great problem. Other cooler commodity holdings—cheese, shell eggs, pork and lard—are relatively low and between August 1 and the normal cooler peak about November 1 should continue to be withdrawn from storage.

With freezer occupancy 6 points below the previous August low in 1940, and the July increase in freezer occupancy exactly the same as the average for the past 5 years, peak freezer occupancy, it appears, will create little difficulty from the storer's point of view this year. Occupancy in public freezers normally rises from 1 to 3 points between August 1 and the winter peak November 1. Commodities expected to move into storage during that time are: frozen fruits and vegetables, butter, poultry and fish. Eggs and cream normally are withdrawn during this period while meats reach a low about October or November and then begin to move into storage.

Cold Storage Stocks of Selected Frozen Fruits and Vegetables

STOCKS of frozen peaches in storage on August 1 were the lowest for any August on record since 1944. This may account for the unusually high ratio of retail packages to large-sized containers. Consumer-sized packages comprised 37 per cent of the peaches classified as to container size. Frozen raspberries showed a considerable in-movement of larger sized containers during July but percentage-wise raspberries in retail containers were greater than at any time during the year with 14 percent of the stocks in this type package. The quantity of frozen strawberries in retail packages was almost the same as last month. Because of fewer returns however, the percentage of stocks reported in consumer-sized packages represented 38 per cent of the stocks compared with 34 per cent last month.

COLD STORAGE STOCKS OF FROZEN FRUITS AND VEGETABLES IN STORAGE AUGUST 1 AND JULY 1, 1949 IN PACKAGES OF ONE POUND OR LESS (000 LBS.)

	August 1, 1949		July 1, 1949	
	Lbs.	Pct.	Lbs.	Pct.
Peaches	1,807	37	2,290	37
Raspberries	3,465	14	1,076	10
Strawberries	20,278	38	20,349	34
Asparagus	4,398	75	4,833	72
Beans, lima	8,626	61	9,073	62
Beans, snap	6,251	63	3,370	67
Corn, sweet	1,727	67	1,763	59
Peas, green	37,286	55	32,570	59
Spinach	9,363	77	10,902	78

Approximately three-fourths of the frozen asparagus reported by container size were in retail-packages on August 1. This compares with 72 per cent reported last month and 75 per cent reported in August 1947. The out-of-storage movement of lima beans during July seemed to be largely those stocks packaged in retail-sized containers since only 61 per cent of the lima beans classified as to package size were in containers under one pound compared with 62 per cent last month. Frozen snap beans, on the other hand, moving into storage during July reduced the percentage of retail packages reported in storage last month from 67 to 63 per cent.

Only little more than a third of the frozen corn in storage was classified as to package size of which 67 per cent was in consumer size packages, 33 per cent in larger sizes. Although the coverage for stocks of frozen peas was not as great as last month, it appears that the net increase of stocks in storage was primarily in large-sized packages. Whereas only 41 per cent of the frozen peas were reported in packages of over one pound last month, on August 1 this type package comprised 45 per cent of the frozen peas reported. There was little change in the ratio of retail packages to large-sized packages for frozen spinach during July. Seventy-seven per cent of the stocks were reported in consumer packages compared with 78 per cent on July 1.

Frozen Foods
Reg. U. S. Patent Office
COVERING EVERY PHASE OF THE QUICK FREEZING OF PERISHABLE FOODS—PREPARATION, PACKAGING, FREEZING, STORAGE, DISTRIBUTION, DESIGN, CONSTRUCTION, EQUIPMENT, OPERATION OF LOCKER PLANTS.

Merchandising Provides Central Keynote for Tenth Annual Locker Convention

THE 10th annual convention of the National Frozen Food Locker Association held at the Hotel Stevens, Chicago, August-28-31, attracted a representative attendance of locker operators and supply representatives from all sections of the country. Registrations were made from 39 states, the District of Columbia and Sweden, and a number of visitors were present from Canada.

The program was based largely on the theme of merchandising, designed to point the way to newer and more effective merchandising practices. As pointed out by one of the speakers, the locker business for some years had been operating in a buyer's market with all space filled to capacity and with a waiting list; but now with a greatly increased capacity and the easing off of demand for lockers and processing service, it is definitely a seller's market.

Business Session

The convention proper opened Monday forenoon with a business session covering reports of officers, election of officers, and a brief presentation of a proposed promotional advertising campaign.

Vaughn R. Walker of Watseka, Ill., retiring president, opened the session with a brief informal comment on the work and accomplishments of the association during the past year. He characterized it as a successful year and said this belief had been confirmed by numerous comments from members, some complimentary and some critical, both of which are valuable.

The treasurer's report presented by W. C. Naylor, Boyne City, Mich., showed the association's finances in good order with gross income of some $1400 over last year and a total of about $41,000 receipts with a cash balance of about $4,000 and investments amounting to about $11,000.

S. T. Warrington, secretary, reported briefly on the work of the association office during the past year, the volume of which he suggested was indicated by the sum of $6,000 spent for postage. One of the forward steps, he said, was the acquisition and establishment of The Locker Operator as the official magazine of the association. Another significant work was the preparation and merchandising of promotional mailing pieces for use by members in their merchandising and advertising programs. One of the important functions of the National Association, he said, is to build a Service Bureau for the locker business. This is furnished in part now by the promotional material being issued and there will be other services as the need for them develops.

New Officers and Directors
National Frozen Food Locker Association

President, W. H. Hasebroock, West Point, Nebr.

Vice-presidents, Roy J. Burns, Carroll, Ia.; W. S. Winstead, Madisonville, Ky.; A. L. Sprague, Jackson Center, Ohio

Treasurer, E. B. Nelson, Fairmont, Minn.

Directors: M. L. Stewart, Pomona, Calif.; B. M. Anderson, Layton, Utah; H. G. Godshall, Lansdale, Pa.; Vaughn Walker, past-president, Watseka, Ill.

Promotional Program

The proposed new promotional program was presented briefly by Otto M. Forkert, consultant on the national merchandising and advertising campaign. This educational material, he said, is now being made available to all members, the media being direct mail, newspaper advertising and publicity, local radio programs, window and display cards and posters. Samples of this material distributed at the convention are now available to locker operators.

Referring briefly to the rift between the National Frozen Food Locker Association and the Frozen Food Locker Institute, H. L. Titus, former president of the association and others, pointed out that there is not room for two associations in the locker industry and that a definite effort must be made by both associations to iron out the differences that had developed between the two boards of directors. S. T. Warrington, secretary, reviewing the situation briefly, explained that the chief differences concerned division of receipts from the annual convention exhibit, and holding of separate conventions by each organization. Following some discussion, it appeared to be the concensus of opinion of the members that a way should be found for a program of action to be developed under which both associations could cooperate fully.

Second Session

At the Tuesday afternoon session, Carl Dunkle, head technician of the U. S. Department of Agriculture, presented a discussion of what m i g h t be done to improve locker plant products, based upon a recent locker plant

survey. Mr. Dunkle called attention to improved technique in processing aimed at improving quality and reducing spoilage and deterioration. This, he said, was accomplished through control of bacterial action and control of temperature, air circulation, and humidity. The survey showed that there is a greatly accelerated increase of curing, and smoking services being provided by locker plants.

Economic Aspect

L. B. Mann of the U. S. Department of Agriculture gave a report on the economic aspect of the locker industry. Through the middle and late 30's, he said, the locker business was primarily processing and storing fresh meats and little curing was done, but now approximately one-third of the plants cure and smoke meats and about 20 per cent store poultry. Other services have shown a big increase such as merchandising, ice cream manufacturing, and selling frozen foods.

In 1935, which is generally accepted as the beginning of the industry, locker rentals averaged $9.00 per locker but today the average is close to $15. Construction costs, formerly about $35 to $40 per locker, has now risen to $75 to $100 per locker.

The future, he said, indicates continued expansion. Frozen foods are becoming better known and more are being sold. Sales of home freezers offer an opportunity to locker plants because most people use these cabinets only for storage. More business opportunities will open up through commercial storage, selling of meat to restaurants and meat stores and high temperature storage for fruits, eggs, ice cream, bakery goods and other products, he concluded.

Surplus Food Program

H. S. Bolin also of the Department of Agriculture talked on the relationship between locker plants and the surplus food program. He pointed out that a recent report showed that children in the rural areas are not as well fed as those in cities. This, he said, offers a challenge to locker plants, most of which cater to rural and small town customers. In line with this program, the Department of Agriculture has initiated a program to increase the use of all foods produced and issues a bulletin listing surplus food crops in various parts of the country. In the school lunch program particularly locker operators have an opportunity to work through school superintendents. And they also can encourage people to freeze instead of canning their surplus food. Training of school children in good food habits through providing proper school lunches is particularly valuable because they will carry over the things learned into their adult life.

W. C. Naylor told of a meeting held under the auspices of the Michigan Locker Association to further this program. To facilitate contact between school administrators and locker plant operators, all schools were sent lists of such plants. Instruction was also made available to 4-H Clubs and other community clubs in regard to storing vegetables. Work shops were set up to teach how to process vegetables and to tell and show how locker plants can be used for the preservation of surplus foods.

The Art of Selling

O. J. McClure, sales consultant, talked on the art of salesmanship. Selling, he said, is dealing with people and the successful salesman must know people. He advised locker plant operators in contacting prospects to deal in terms of the prospect's needs and problems and what the locker plant can do for them in terms of those problems and needs.

Final Session

At the final session held Wednesday morning, E. W. Williams of New York, talked on commercial frozen foods in relation to locker plant operation. The sale of frozen foods, he said, is going to be a big element in the success of locker plants. They are becoming more numerous and more available and the locker plant is ideally situated for both distributing and retailing these foods. Prices are expected to come down and chain stores are starting to sell them and the year 1949 is expected to produce the largest retail pack on record, he said.

Charles Trigg, executive secretary of the Fish Distributors Association, talked on the selling of fish by locker plants. Fish, he said, is in a different category from fruits, vegetables and meats in that in most localities this product is not produced locally but is shipped in. The full advantages of fish merchandising have not been realized by either retailers or locker operators and most retailers have inadequate space capacity. One of the important factors in building a fish business is that of providing high quality. Locker plants are well situated to develop such business but to develop as satisfactory business they must watch their quality and this means buying at a reasonable price instead of trying to buy at a low price.

Warren J. Dills, general sales manager, Honor Brand Frosted Foods, talked on selling frozen foods through locker plants. There are three main factors, Mr. Dills said, in building this business—that of quality, advertising and adequate supply. The recent depression in the frozen foods business represented by the huge over-supply of low grade frozen foods on the market in 1946, has been pretty well cleaned up and many locker plants have gone into this business of selling commercially packed frozen foods with very good results.

Annual Ham Show

The annual cured ham show held Monday afternoon was one of the high points of interest. Sixty-five hams were entered and were placed on display at the convention Tuesday.

Breakfast Sessions

A series of early morning sessions were held Monday, Tuesday and Wednesday mornings from 7:30 to 9:00 a.m. covering slaughtering, operating costs, home units, construction, curing and smoking, and merchandising. These early sessions were a carry over from previous conventions. They proved very popular, with good attendance and spirited discussions. Leaders were all men of experience and ability.

Clinics

On a similar plan, Clinics were held on each of the three afternoons from 1:45 to 3:00, and 3:15 to 4:30 on construction, advertising, home units, poultry processing, merchandising, fruit and vegetable processing, operating costs, and cutting and wrapping. These were likewise well attended and developed much discussion.

At the clinic on home units, it was brought out that these home units are here to stay and a prediction was made that a million will be sold this year. Recognizing this fact, discussion centered around how locker plants can sell them. Many operators reported that they are merchandising these units, tying up their sales with rental of a locker. Locker operators generally were advised that instead of allowing them to become competitors they should utilize them as adjuncts by encouraging their use as temporary

storage units. Many operators are selling either their own or commercially frozen foods to home unit owners.

Fruit and vegetable processing, at the clinic on that subject, was cited as an important part of the locker business. During the summer and fall, meat processing is at a low ebb at which time fruit and vegetable processing is at its peak. While this does not furnish a highly profitable business, it does make for more plant activity, builds good will and helps to increase locker rentals. It also stabilizes the patron's use of his locker by keeping it filled more nearly to capacity. Another source of profit, it was pointed out, is the sales of containers.

Operating Costs

At the clinic on operating costs, results of a recent survey were reported showing that there has been a substantial increase in total locker income but that this had come from increased charges and service fees rather than increased volume of business. Labor costs are out of proportion to income during the summer months which indicates that some new summer business is needed to counteract this downward swing. Some unfavorable factors affecting net income were listed as follows: seasonal fluctuation in volume of processing, high labor cost, low volume of smoking and curing, too large facilities, high power cost, unrented lockers. An important factor in increasing gross income was stressed, that of merchandising to increase volume, especially during the summer months.

The demand and opportunities for poultry processing, it was pointed out at the clinic on that subject, enables many locker plants to provide a profitable service, of value to their customers. Two things are necessary to successful operation: proper equipment and knowing how to do the job efficiently. One operator performs this service for a commercial poultry raiser who supplies dressed poultry to restaurants, hotels and retail outlets. In this, as in fruit and vegetable processing, a way is provided to fill in the off season months.

Entertainment

The annual dinner of the association, followed by a night club variety show and dancing, was held Tuesday evening, preceded by a cocktail party. For the ladies, luncheons and tours, special movies and a yacht cruise on Lake Michigan were arranged.

Ascorbic Acid and Flavor in Frozen Muskmelons, Grapefruit and Strawberry Puree

AN INVESTIGATION at the University of Illinois on frozen muskmelons and two fruits, demonstrated that packing method is of much greater significance than storage time in the retention of flavor and ascorbic acid by these commodities. Freezer storage periods for as long as nine months were involved in the tests.

This study was undertaken to determine the effect of freezing and freezer storage on the ascorbic acid content of muskmelon, grapefruit sections and strawberry puree and to investigate certain variables in procedure which might influence the amounts retained. Fresh muskmelon, grapefruit, and strawberries are good sources of ascorbic acid. Muskmelon, often referred to as cantaloupe, was among the fruits selected for study because it is commonly grown in Illinois, but is not available throughout the year.

Grapefruit was included in order to find out if the ascorbic acid content is as stable during freezing and freezer locker storage as under other conditions, and strawberry puree was used to determine the amounts of ascorbic acid retained when it was packed with two concentrations of sugar in two types of containers. There are no reports in the literature which deal with the effect of freezer storage on the retention of ascorbic acid in muskmelon and grapefruit. However, several studies have been carried on to determine the amounts of ascorbic acid in the fresh fruit.

Muskmelon Tests

In 1945 two varieties of muskmelon, Bender's Surprise and Hale's Best, were grown under the supervision of the Department of Horticulture of the University of Illinois. The melons were harvested at suitable stages of maturity for freezing and were brought to the food research laboratory for processing on the day they were picked.

The muskmelons were halved and the seeds taken out. Half of each melon was used for the sirup-packed fruit and the other for the plain-packed fruit. The halves were sliced, rind removed, and slices cut into "bite-size" wedges. Three hundred and ten-gram lots of fruit were packaged in heat-sealable, cellophane-lined pint containers without the addition of sugar or sugar sirup (plain packed) or with 150 milliliters of 40 per cent sugar sirup. This procedure was carried out on four days. Determinations were made of the reduced ascorbic acid content of the fresh fruit and of the muskmelon after approximately 24 hours in the freezing unit and thawing, and after freezing followed by one, three, six, and nine months of freezer storage and thawing.

An unknown variety of muskmelon was purchased on the market in 1946. These melons were prepared for freezing according to the procedure used the previous year, except that the amount of sugar sirup per pint container was increased to 175 milliliters. Ascorbic acid determinations were made after the same intervals. One hundred-gram samples of fresh fruit, one-third of a container of plain-packed fruit, and one-fifth of the liquid and solid portions of the sirup-packed fruit were weighed out for this purpose.

Grapefruit Tests

Medium-white grapefruit from Texas was purchased on the local market in March, 1946. The grapefruit was peeled, sectioned, and apportioned into 11 lots; the ascorbic acid content of one of these was determined immediately. Five lots of grapefruit were packaged without sugar or sugar sirup and five lots with 40 per cent sugar sirup in heat-sealable, cellophane-lined pint containers. Four hundred and six grams was the average weight of grapefruit used for the plain-packed fruit and 397 grams of grapefruit with 80 milliliters of 40 per cent sugar sirup for the sirup-packed fruit.

This procedure was repeated four times. One hundred

grams of fresh grapefruit and one-fourth of the solid and liquid contents of each container which had been allowed to thaw in the refrigerator overnight were weighed out for ascorbic acid determinations. These were done after approximately 24 hours in the freezing unit and thawing, and after freezing followed by one, three, six, and nine months of freezer storage and thawing.

Strawberry Tests

Four lots of strawberries of the Blakemore variety were purchased on the market in May, 1947. The berries were washed, hulled, and pureed through a conical aluminum sieve with a wooden masher. The puree was mixed with sugar in a five-to-one and a three-to-one ratio, and the mixtures packed in cellophane-lined pint containers which were heat-sealed, or in glass jars designed for freezer storage. Reduced ascorbic acid was determined by the formaldehyde modification of the Robinson and Stotz (1945) method. Seventy-five-gram samples of fresh strawberry puree, before the addition of sugar, and of the thawed, frozen puree after one, three, and six months of freezer storage, were used for the determinations.

All the samples with the exception of the muskmelon processed in 1946 were frozen in a freezing unit of the plate type. Temperatures on the plates ranged from –11.2 to –22 F. After approximately 24 hours on the plates the containers were transferred to freezer storage at a temperature of 1.4 F. In 1946 the muskmelon was frozen and stored in a home freezer where the temperature was 0 F. in both the freezing and storage compartments.

In the original report, tables are presented to show the ascorbic acid values of the fresh fruits, those packed by different methods and frozen, and those held under freezer storage for the different intervals. The significant results of the investigation as stated in the summary are as follows:

Summary of Results

Freshly harvested Bender's Surprise and Hale's Best muskmelon, packed for freezing without sugar or sugar sirup, retained 26 and 37 per cents, respectively, of the reduced ascorbic acid originally present after 24 hours in the freezing unit and thawing overnight in the refrigerator. Significantly larger percentages were retained when the same varieties were packed in 40 per cent sugar sirup, 77 per cent ascorbic acid in Bender's Surprise, and 86 per cent in Hale's Best muskmelon. Further losses during nine months of freezer storage were not significant except in the case of the plain-packed Hale's Best muskmelon, where the ascorbic acid retention decreased from 37 to 18 per cent.

In muskmelon purchased on the market the per cent retentions of reduced ascorbic acid in the thawed, frozen samples ranged from 90 to 96 for the sirup-packed fruit and from 36 to 41 for the plain-packed fruit. After freezing and each interval of freezer storage there were significantly greater amounts of reduced ascorbic acid in the sirup-packed fruit. Neither pack gave evidence of significant losses of ascorbic acid during nine months of freezer storage. The presence of dehydroascorbic acid in the plain-packed fruit is indicated by the greater amounts of total, rather than of reduced, ascorbic acid present, although the differences in percentage retentions are not statistically significant. In the sirup-packed fruit there were negligible amounts of dehydroascorbic acid.

No significant losses of reduced ascorbic acid occurred in grapefruit sections packed with or without 40 per cent sugar sirup during 24 hours in the freezing unit followed by thawing in the refrigerator. The percentage retentions after one to nine months of freezer storage ranged from 93 to 102 in the plain-packed fruit and 96 to 102 in the sirup-packed.

The muskmelon and grapefruit, packed for freezing in 40 per cent sugar sirup, were more palatable than the plain-packed fruits after freezing, intervals of freezer storage, and thawing.

Strawberries of the Blakemore variety, pureed, mixed with sugar in the proportion of five parts of puree to one of sugar or three parts of puree to one of sugar, and packed in cellophane-lined cartons or glass freezer jars, lost approximately 20 per cent of the reduced ascorbic acid content after freezing, one month of freezer storage and thawing. No further losses occurred during three and six months of freezer storage. The two concentrations of sugar and the two types of containers used in this study has no significant effect on the retention of ascorbic acid.

The complete report of the investigation is published in Food Research, May-June, 1949. "Effect of Freezing and Freezer Storage on the Ascorbic Acid Content of Muskmelon, Grapefruit Sections, and Strawberry Puree," by Jean Chase Wolfe, Royene F. Owen, Virginia R. Charles, and Frances O. Van Duyne, Department of Home Economics, University of Illinois, Urbana, Ill.

Big Peach Crop Offers Opportunity for Locker Operators

THIS year's peach crop, 75,063,000 bu. in size, spells opportunity for freezer locker operators, according to an announcement by the United States Department of Agriculture. The crop is 15 per cent larger than last year, and prices are down materially, making the fresh ripe peaches an excellent fruit for freezing for use later.

Locker operators can turn the big peach supply to profits and, in the process, help develop local taste and future demand for frozen fruit, by encouraging peach processing this year. They can make a goodly contribution to nutrition in their communities also by encouraging processing to make the fruit available for next winter when fresh fruit supplies are much lighter and higher in price. Peaches have been selling at lowest levels since before the war, according to market news reports.

The individual patron can be encouraged to make excellent use of the peaches by buying them now and having them frozen for use later. The supplies also can be utilized to a large extent by encouraging the freezing of peaches for school lunch programs now while they're abundant. Community groups, Parent-Teacher Associations, women's clubs, school officials, can be contacted to provide better nutrition and menu variety for the school lunches by freezing a supply of the ripe, flavory peaches now.

Separate Marking of Frozen Food Solids and Liquids

THE report of the Committee on Methods of Sale of Commodities at the recent conference on weights and measures, included recommendations that the amount of solids and amount of liquids be separately declared in the quantity marking of packaged frozen foods. The Conference was sponsored by the National Bureau of Standards.

Frozen Food Locker Plants

A TOTAL of 11,245 locker plants in the 48 States was reported by the State Extension services as of July 1949. This is an increase of 628 over the eleventh annual count made in 1948. A few states reported a small decrease in total number of plants.

Twin-Duct Air Distribution System Provides Flexible Air Conditioning

(Continued from page 20)

to measure only five inches in depth. Over 250 tons of galvanized steel were used in fabricating the twenty miles of ducts.

Connecting the fan rooms with the central heating and refrigerating plants in the basement are risers which are much smaller than those which would have been required if the separate fan room idea had not been employed.

Refrigeration Plant

The refrigeration plant of the building consists of three 300 hp. centrifugal compressors using Freon 11 refrigerant and having a capacity of 333 tons each. Three chilled water pumps, one for each chiller (which are located one above the other), circulate the coolant through the building.

Forced draft cooling towers are located on the roof of the building, and are hidden from view by a sheet steel superstructure which is used as a sign bearing the flying horse of the General Petroleum Corp.

One hundred and fifty horsepower in the electric motors alone are used in the distribution system. Another 600 hp. of capacity is contained in the four oil or natural gas boilers. The 900 hp. of capacity in the three centrifugal refrigeration compressors brings the total to 2100 hp. of weather-making equipment.

Structural Features Provide Additional Insulation

Structural features of the building which provide additional insulation are:

1—The use of pumice in structural concrete, which gives about double the insulating quality of ordinary concrete, in one exterior wall and the building floors.

2—The use of hollow walls with gunite surfaces for three exterior walls and the use of steel interior walls containing rockwool, both of which have over twice the insulating qualities of conventional materials for such jobs.

3—The use of a double ceiling above each floor, one formed by acousti-celotex, and containing the lighting fixtures and air conditioning ducts, and other formed by vermiculite plaster, which fireproofs the structural joists supporting the concrete floors.

4—The use of aluminum "fins" which run vertically up three sides of the building to keep direct sun off the glass areas. Interior aluminum venetian binds also act as insulation to keep exterior heat absorption down.

Estimated savings from the aluminum "fins" alone are 100 tons of refrigeration capacity, with a consequent reduction in operation cost.

Ground floor areas, which are to be leased for store areas, will have separate heating and air conditioning plants fitted to the needs of the tenants.

W. S. Kilpatrick & Co., Los Angeles were contractors on the project. Basic approach in the design of the equipment was handled by the office of Ralph E. Phillips, consulting mechanical and electrical engineer.

This Ice Lady No Clinging Vine

EIGHT times a grandmother, Mrs. Celia Dauray of Central Falls, R. I., 49, is the undisputed "Ice Lady of Central Falls." For 25 years she has delivered 100-lb. cakes of ice and larger, and now operates an ice station that handles some five tons daily.

Frozen Food Transportation

(Continued from page 19)

icing is also done at some 195 other contract points. The combined length of platforms is 93,236 feet or close to 18 miles. Our Roseville, Calif. plant is the largest incidentally, the largest in the world, with a manufacturing capacity of 1,150 tons daily, and storage capacity of 51,000 tons. Four complete and modern car shops are located at Roseville, Los Angeles, Colton, California; and Nampa, Idaho. Other shops are located at Tucson and Pocatello. These are supplemented by a number of so-called cleaning or light repair tracks.

With the advent of the Frozen Foods Industry, it was necessary to undertake the development of a better car and means of producing intensive refrigeration. Pacific Fruit Express Company undertook the initial research work and conducted a series of tests to determine the additional amount of insulation required and the most efficient means of mixing ice and salt in bunkers to obtain minimum temperatures.

Following these experiments 100 cars were built in 1932 equipped with 7 inch insulation in roof and floor and 6 inches in sides and ends. These cars were of the end bunker type relying on natural convection currents for air circulation. Later improvements were added in the form of fans for forced air circulation and wall flues added to walls of car. These items added to the efficiency of the car in general.

Our business does not stop with the furnishing of an insulated car and refrigeration, rather it has many other functions, all designed to afford the best service and assistance possible to the perishable shipping public.

Another service that PFE renders and one which lies in the background and is ofttimes overlooked by the trade, is its maintenance of offices at strategic points throughout the country which provide diversion and passing records to shippers, the details of which are arranged so that an up-to-date record of shipments is always available to provide expeditious handling. As every shipper and receiver knows, this information is invaluable at times in meeting constantly changing market conditions.

Dry Ice Refrigerators Installed in Railroad Dining Car

A NEW type dining car recently was delivered to the Union Pacific Railroad in which the perishable food refrigerators in the kitchen, pantry and steward's locker are operated by Dry ice.

Thermostatically controlled, the kitchen refrigerator holds 100 pounds of "Dry Ice." The refrigerators are iced at the terminals and replenished once en route where wet ice formerly required icing at six stations on the route between Omaha and the West Coast. Also, the refrigerators are iced from inside the car, doing away with overhead icing and the openings outside the car that may allow dust to enter. Mechanical refrigeration has been abandoned in the interests of simplicity of operation and maintenance, and the Dry Ice refrigeration has proved less costly and more compact than the wet ice refrigeration which was formerly used.

Original design for the kitchen and pantry was made by the dining car department of Union Pacific. During the designing and building, the new car was under observance by the U. S. Public Health Service and was called by that bureau, "an outstanding example of dining car kitchen construction."

Motor Vehicles Move Larger Volume of Fruits and Vegetables

TEXAS growers and shippers of fruits and vegetables were credited by John B. Hulse, secretary-manager of the Truck-Trailer Manufacturers Association, Washington, with having helped to bring about an evolution in transportation of their products by utilization of refrigerated trailers for long hauls.

Mr. Hulse, in addressing a session of the Texas Citrus and Vegetable Growers and Shippers Convention in the Hotel Shamrock at Houston, pointed out that whereas only a few years ago the proportion of shipments by highway was relatively small, the motor vehicle now has captured as much as half of the citrus and vegetable traffic and in some instances a great deal more.

He emphasized that advantages of motor transportation have been made possible by manufacturer improvements in vehicle designs together with development of adequate insulation and cooling. Grower and shipper demand for such vehicles, he said, evidences the forward-looking attitude of the Texas fruit and vegetable industry.

Trend to Motor Transport

As to the trend toward use of motor transport, Mr. Hulse cited the following illustrations from U. S. Department of Agriculture records: Texas grapefruit: In 1944, motor vehicles moved 9.4 per cent of the crop; thus far in 1949 shipments by motor vehicle have accounted for 46.5 per cent of the crop. Oranges: In 1944, 45.5 per cent of the crop was shipped via motor vehicles; thus far in 1949 the proportion is 81 per cent.

"These are percentages of total shipments, so as the truck-trailer percentages increased, the percentage shipped by all other means must have come down," Mr. Hulse commented.

After discussing in considerable detail the technical side of designing and choosing refrigerator trailers, Mr. Hulse summed up the points of his address thus:

"Motor transport is quicker than rail service (which means less time for spoilage).

"It offers easier riding, less jolting and bruising of fruit and vegetables.

"It is competitive in cost, and perhaps even cheaper than rail service now that rail rates are up on an average of 57 per cent since 1946, with motor rates not proportionately increased.

"It is a more flexible and a more adaptable service as it is furnished by a relatively young and growing industry, an industry anxious to give better service and one not yet bound too closely by set regulations and 'red tape'."

Advising on how to assure successful shipment of perishables, Mr. Hulse concluded:

"Pre-cool your produce before shipping. Pre-cool your trailer before loading.

"Provide for a free flow of air around your cargo by use of wall racks, floor racks, and by leaving adequate space over the top of the load.

"Provide a refrigeration system of sufficient heat absorption capacity to maintain the temperature required by the product you are to haul. Be sure of adequate reserve heat absorption capacity to give a factor of safety in case of delays, excessive outside temperatures or other unforeseen factors.

"Insulation materials of exceptional quality are now readily available. Some weigh as low as ¾ of a pound per cubic foot. They resist sagging, resist moisture absorption, are vermin proof, fireproof and do not readily absorb odors. Be sure, however, to specify an adequate thickness of insulation so that your refrigeration system will not be overtaxed."

ASRE Data Book Published

THE sixth edition of the refrigeration fundamentals issue (Basic Volume) of the ASRE Data Books has just been published by the American Society of Refrigerating Engineers. This new sixth edition, under the direction of Prof. Burgess H. Jennings as editor-in-chief and his staff of editors, presents a volume of new material and up to-date data in accordance with the newest developments and practice in the fields of refrigeration and air conditioning. As in previous editions, the authors of the 42 chapters in the book are authorities on their respective subjects.

Practically all of the text matter has been rewritten and the amount of tabular material has been greatly extended to supply the latest data on refrigeration operation and design factors. New psychrometric charts developed for ASRE and covering an extensive range from low to high temperatures are included, along with complete discussions of their use and application to air conditioning and refrigeration.

Refrigerant tables have been expanded and recomputed to give more convenience in their use, particularly in the superheated vapor range. In addition, many charts covering the newer refrigerants, particularly the Freon family, have been added.

Engineering analyses of refrigerating equipment range from domestic units to large size centrifugals, and new compilations of data on insulation, insulating materials, as well as on heat transfer coefficients, are included.

The book contains over nine hundred pages of information, including 233 tables, 362 illustrations, and four inserts, as well as a glossary and index. The price of this new edition of the ASRE Data Book is $7.00 per copy in the United States and $7.50 elsewhere.

ASRE Annual Meeting

THE 45th annual meeting of the American Society of Refrigerating Engineers will be held at the Edgewater Beach Hotel, Chicago, Ill., December 4-7, 1949. Centrally located, this meeting is expected to attract engineers from all over the country, and plans are being made for a record attendance. In line with this, the technical sessions have been geared to appeal to a larger group with varied interests.

This is the first time the annual meeting has been held in Chicago since 1940. There was a good representation of engineers in the refrigerating industries and indications are that the 1949 meeting will be even larger.

Several general sessions and at least three interesting forums for full discussion of problems relating to domestic refrigerators, condenser water, and room air conditions, are planned. The Program Committee under the chairmanship of Dr. Richard C. Jordan, has gone all out to line up a most diversified technical program. All those present are bound to find some papers and discussions of particular interest to them.

On the entertainment side, Fred Neff, chairman of the Entertainment Committee, promises a gala time, details of which are not ready for announcement. The Tuesday evening dinner dance will be held in the Marine Dining Room of the Edgewater Beach Hotel. Several unusual trips are being arranged by the Chicago Convention Committee, one, in all probability to the Stock Yards. Entertainment for the ladies will be handled by a special committee, headed by Mrs. J. T. McShane.

Those who expect to be among those present are urged to make their hotel reservations immediately.

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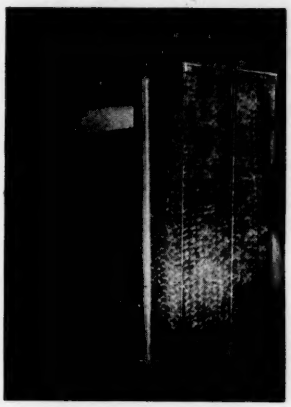

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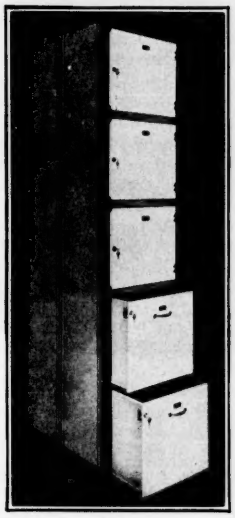

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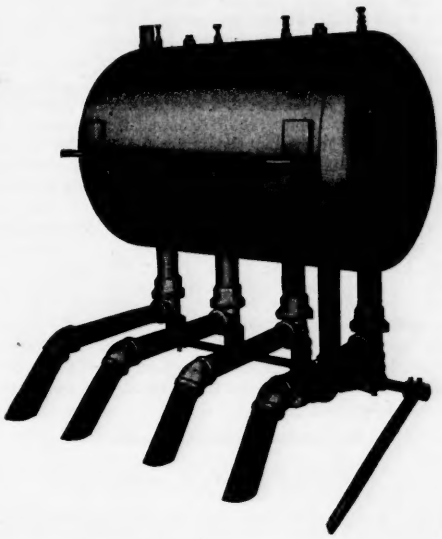

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Conference on Weights and Measures Changes "Centigrade" to "Celsius"

THE Ninth General Conference on Weights and Measures, held in October 1948, adopted the name "Celsius" for the scale of temperature which has more commonly been called "Centigrade." This action, which had not been proposed in advance of the Conference, arose from a question regarding preferred usage in French, the sole official language of the Conference. The decision therefore may be considered as applying strictly only to that language. In the interest of eventual uniformity of practice the use of "Celsius" appears desirable, but it is not practicable to impose this term on those who prefer "Centigrade."

In preparation for the General Conference the National Bureau of Standards submitted a revised text defining the International Temperature Scale to supersede that adopted in 1927. The proposed text was drafted in English and, in accordance with common English practice as well as the official French text adopted in 1927, it used the name "Centigrade." This name was carried over into the French translation prepared for consideration by the Advisory Committee on Thermometry in May, 1948. However, in the printed report of that meeting, the term "Centigrade" had, in most cases, been changed to "Centésimale," the term that is used in the French law governing weights and measures. When asked to choose between the two the International Committee on Weights and Measures and the General Conference voted to substitute "Celsius."

With regard to the merits of the decision it may be remembered that Celsius (abbreviated C) is analogous to the names Kelvin, Fahrenheit, Réaumur and Rankine used for other temperature scales, that it has previously been used considerably in some countries, and occasionally in America, being included in Webster's dictionary. It might also be argued that "Centigrade" is logically ambiguous, since the absolute Kelvin scale, as well as the "Centigrade" scale, has 100 degrees between the ice point and the boiling point of water. On the other hand, the name "Centigrade" is thoroughly established in English-speaking countries, the need for choosing between that name and "Centésimale" arises only in French, and the decision on a term in the official French language of the Conference may not be considered as controlling the terms to be used in translating into other tongues.

National Safety Convention

TALKS by important business leaders in some of America's largest companies will highlight the program of this year's National Safety Congress and Exposition, to be held in Chicago October 24-28. Nearly 12,000 safety-minded persons from all corners of the United States and from Canada and other parts of the world will meet in Chicago for five days at the 37th annual convention of the National Safety Council.

They will hear such outstanding businessmen as Gustav Metzman, president of the New York Central System; James Tanham, vice president for industrial and public relations of the Texas Co. and chairman of the board of directors of the National Safety Council; James E. Trainer, vice president of Firestone Tire and Rubber Co., and Earl Moore, vice president for industrial relations of Carnegie-Illinois Steel Corp.

A feature of the Congress will be a labor-management safety symposium on what can be done by labor organizations and industry to reduce off-the-job accidents. Labor's viewpoint will be presented by James L. McDevitt, president of the Pennsylvania Federation of Labor, A. F. of L., and Harry Read, executive assistant to the secretary-treasurer, Congress of Industrial Organizations.

Sessions on industrial safety will be held at the Stevens, Congress and Morrison hotels. Commercial vehicle activities will be centered in the Palmer House. The Morrison hotel will house the school and college, farm and home sessions. Traffic meetings will be held in the Sherman hotel, where the public safety exposition also will be located. The women's activities luncheon will be held in the La Salle hotel.

Committee on Code for Pressure Piping Considers Revisions

THE Sectional Committee on the Code for Pressure Piping, ASA-B31, has been reorganized under the chairmanship of F. S. G. Williams of the Taylor Forge & Pipe Works, 50 Church Street, New York, N. Y., with Sabin Crocker, Ebasco Services, Inc., 2 Rector Street, New York, N. Y., as vice chairman, and Lester W. Benoit, Manufacturers Standardization Society of the Valve and Fittings Industry, 420 Lexington Avenue, New York, N. Y., as secretary. The present Code for Pressure Piping, with Supplement No. 2, as approved by the American Standards Association on April 7, 1947, is up for consideration and for revision.

Section 5, covering refrigeration piping systems of the Code for Pressure Piping, is up for revision under the chairmanship of A. C. Buensod, 60 East 42nd Street, New York, N. Y. The air conditioning and refrigerating industry is also cognizant of the fact that the B-9 Safety Code for Mechanical Refrigeration, sponsored by the American Society of Refrigerating Engineers under the ASA procedure, is also in the stage of being revised.

In both the present Code for Pressure Piping, ASA-B31, and in the ASA Standard for Mechanical Refrigeration, B-9 Refrigerant Piping is included. It is therefore, only natural that there should be a very close coordination between these two codes, as obviously the piping requirements should be the same for each of the codes. There is an indication that is quite general among the committee members that the Code for Pressure Piping should contain the Refrigerant Piping and be the basis for piping that is to be used in the B-9 Safety Code for Mechanical Refrigeration.

Because of the wide interest that has been displayed in the revision of both of these codes, the committee members for each of the codes wish to obtain all the help and comments possible from the various segments of the industry, including producers, suppliers, contractors and users. Mr. Buensod, the chairman of the refrigeration piping section of the Pressure Code for Piping, wishes to enlist the support of all of the above segments and any suggestions made will receive due consideration.

Canadian Mechanical Refrigeration Code Being Revised

THE first draft of the second edition of the Canadian Mechanical Refrigeration Code designated as CSA Code B52—Mechanical Refrigeration, sponsored by the Canadian Standards Association, has been completed and will now be considered by the various industry committees.

With the publication of the basic code, changes or recommendations will be considered by the committee at its next meeting. The Canadian code follows closely most of the provisions contained in the American Standards Association B9 Refrigeration Safety Code now in the process of revision.

SPECIFICATIONS ON ICE STATION

ALL AIRCRAFT ALUMINUM CONSTRUCTION: Outside structure, .051 aluminum; dead air space; .032 Aircraft aluminum; permanently secured Fibre glass insulation; inside structure, .051 Aircraft aluminum. Vapor sealed throughout.

REFRIGERATOR DOOR: .051 Aircraft aluminum construction well insulated with batts of Fibre glass.

REFRIGERATION: 1½ H. P. condensing unit with banks of vacuum cold plate evaporators (more effective than coils). Guaranteed to maintain below freezing temperature with outside temperatures of 100°.

COIN MECHANISM: Lever operated, positive delivery, rejects slugs; also returns money when machine is empty.

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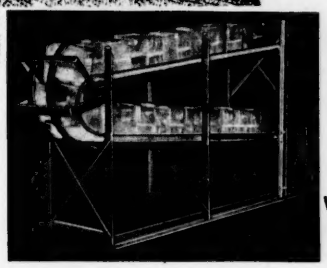
Vending mechanism is positive and fool-proof. Vending lever is clutch operated, preventing breakage of handle and damage to mechanism. A customer, after insertion of money, can receive only one unit of ice at a time. Jackpot operation is impossible. Coin mechanism rejects slugs and returns money when machine is empty. In appearance, and in profitable operation, a complete Frigid-Vend Ice Station is all you could ask for.

The Station will vend four kinds of ice, two sizes of blocked ice as well as cubes or crushed ice in bags or packages. Or if you prefer you can vend any smaller combination of these four types.



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50 lb. ice blocks model—19 or 38 blocks

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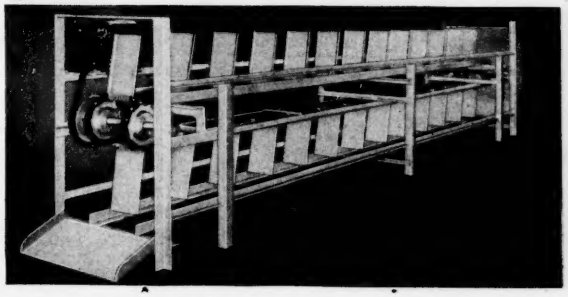

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Capacity: FOUR DECK VENDOR
54 to 78 bags or cartons depending on size of package.

COMING CONVENTIONS

FLORIDA ICE ASSOCIATION
October 13-14, 1949
Soreno Hotel, St. Petersburg, Fla.
MURIEL WASHBURN, Secretary

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS
November 8, 9, 10, 11, 1949
Purdue University, Lafayette, Ind.
EMERSON BRANDT, Secretary

CANADIAN ASSOCIATION OF ICE INDUSTRIES, INC.
November 8-10, 1949
General Brock Hotel, Niagara Falls, Ont., Canada
K. C. McCREA, Executive Secretary

ALL INDUSTRY EXPOSITION
November 14-18, 1949
Traymore Hotel, Atlantic City, N. J.
GEO. MILLS, Director

NATIONAL ASSOCIATION OF ICE INDUSTRIES
November 15, 16, 17 and 18, 1949
Hotel Commodore, New York, N. Y.
MOUNT TAYLOR, Secretary

KENTUCKY ICE MANUFACTURERS ASSOCIATION
November 21-22, 1949
Seelbach Hotel, Louisville, Ky.
RUSSELL T. KING, Secretary

DELTA STATES ICE ASSOCIATION
November 28-30, 1949
Buena Vista Hotel, Biloxi, Miss.
R. N. MILLING, Secretary

AMERICAN SOCIETY OF REFRIGERATING ENGINEERS
December 4-7, 1949
Edgewater Beach Hotel, Chicago, Ill.
M. C. TURPIN, Secretary

SOUTH CAROLINA ICE MANUFACTURERS ASS'N.
December 5-6, 1949
Poinsett Hotel, Greenville, S. C.
GEO. L. ENGLISH, Secretary

SOUTHWESTERN ICE MANUFACTURERS' ASS'N.
December 7-9, 1949
Plaza Hotel, San Antonio, Texas
PRESTON A. WEATHERRED, Executive Secretary- Counsel

CALIFORNIA ASSOCIATION OF ICE INDUSTRIES
December 13-15, 1949
San Francisco, Calif.
L. A. BAILEY, Exec.-Secy.

ILLINOIS ASSOCIATION OF ICE INDUSTRIES
December 14-16, 1949
Jefferson Hotel, Peoria, Ill.
W. D. WRIGHT, Secretary

MISSOURI ICE MANUFACTURERS ASSOCIATION
January 9, 10, 11, 1950
Hotel President, Kansas City, Mo.
V. A. ESPHORST, Secretary-Treasurer

GEORGIA ICE MANUFACTURERS ASSOCIATION
January 18-19, 1950
Ansley Hotel, Atlanta, Ga.
WILLSHIRE RILEY, Secretary

SOUTHERN ICE EXCHANGE
January 18-19, 1950
Ansley Hotel, Atlanta, Ga.
WILLSHIRE RILEY, Secretary

AMERICAN WAREHOUSEMEN'S ASSOCIATION
January 30-February 2, 1950
Edgewater Beach Hotel, Chicago, Ill.
WILSON V. LITTLE, Secretary

NATIONAL ASS'N. REFRIGERATED WAREHOUSES
January 30-February 2, 1950
Edgewater Beach Hotel, Chicago, Ill.
WM. DALTON, Executive Vice-president

OHIO ASSOCIATION OF ICE INDUSTRIES
February 27-28, 1950
Deshler-Wallick Hotel, Columbus, Ohio
GUY W. JACOBS, Secretary-Treasurer

MICHIGAN ICE INDUSTRIES ASSOCIATION
March 2-3, 1950
Hotel Morton, Grand Rapids, Mich.
W. J. CAMPBELL, Secretary

INDIANA ASSOCIATION OF ICE INDUSTRIES
March 8-9, 1950
Lincoln Hotel, Indianapolis, Ind.
RORT. W. WALTON, Secretary

NORTH CAROLINA ICE ASSOCIATION
March 8-9, 1950
Sir Walter Hotel, Raleigh, N. C.
LEWIS H. POWELL, Secy.-Treas.

ASSOCIATION DIRECTORY

AMERICAN INSTITUTE OF REFRIGERATION
H. T. McDermott, Gen. Secretary, 433 N. Waller, Chicago 44, Ill.

NATIONAL ASSOCIATION OF ICE INDUSTRIES
Mount Taylor, Secretary, 1706 L St., N. W., Washington 6, D. C.

NATIONAL ASSOCIATION OF REFRIGERATED WAREHOUSES
Wm. Dalton, Exec. Vice-Pres., Wm. M. O'Keefe, Secy., Tower Bldg., Washington 5, D. C.

NATIONAL ASSOCIATION OF PRACTICAL REFRIGERATING ENGINEERS
Emerson A. Brandt, Sec'y, 435 N. Waller Ave., Chicago 44, Ill.

CALIFORNIA ASSOCIATION OF ICE INDUSTRIES
L. A. Bailey, Secretary, 461 Market St., San Francisco, Calif.

CANADIAN ASSOCIATION OF ICE INDUSTRIES
K. C. McCrea, Exec.-Secy., 389 Park St., Niag. Falls, Ont., Canada

DELTA STATES ICE ASSOCIATION
R. N. Milling, Secretary, Ouachita Bank Bldg., Monroe, La.

EASTERN STATES ICE ASSOCIATION
Samuel Freer, Secy.-Treas., 12 So. 12th St., Philadelphia, Pa.

FLORIDA ICE ASSOCIATION
Muriel Washburn, Secretary, 1931 Silver St., Jacksonville, Fla.

ILLINOIS ASSOCIATION OF ICE INDUSTRIES
W. D. Wright, Secretary, Clinton Pure Ice Co., Clinton, Ill.

INDIANA ASSOCIATION OF ICE INDUSTRIES
Robert W. Walton, Secretary, Board of Trade Bldg., Indianapolis, Ind.

KANSAS ASSOCIATION OF ICE INDUSTRIES
C. A. Berkihiser, Manhattan Ice & Cold Stg. Co., Manhattan, Kans.

KENTUCKY ICE MANUFACTURERS' ASSOCIATION
R. T. King, Secretary, 429 S. Seventh St., Louisville, Ky.

MICHIGAN ICE INDUSTRIES ASSOCIATION
Wm. J. Campbell, Secretary, Pleasant St. at Campbell, Belding, Mich.

MISSOURI ICE MANUFACTURERS' ASSOCIATION
A. V. Esphorst, Secretary, 3820 Washington St., St. Louis, Mo.

MOUNTAIN STATES ASSOCIATION OF ICE INDUSTRIES
J. R. Espy, Secretary, Espy Ice Co., 2229 - 15th St., Denver, Colo.

NEBRASKA ASSOCIATION OF ICE INDUSTRIES
Frank Vogelsang, Secretary, W. T. Good Ice Co., Lincoln, Nebr.

NEW ENGLAND ICE ASSOCIATION
Raymond Wilber, Secretary, 419 Boyleston St., Boston, Mass.

NEW YORK STATE ASSOCIATION OF REFRIGERATED WAREHOUSES
Chas. G. Ashe, 101 Columbia St., Buffalo 5, N. Y.

NORTH CAROLINA ICE ASSOCIATION
Lewis H. Powell, Secretary, Capital Ice & Coal Co., Raleigh, N. C.

NORTHWEST ASSOCIATION OF ICE INDUSTRIES
D. D. Stewart, Secretary, American Bank Bldg., Seattle, Wash.

OHIO ASSOCIATION OF ICE INDUSTRIES
Guy W. Jacobs, Secretary, The Steubenville Ice Co., Steubenville, Ohio

OKLAHOMA ASSOCIATION OF ICE INDUSTRIES
W. A. Hadley, Secretary, 242 Key Bldg., Oklahoma City, Okla.

PACIFIC STATES COLD STORAGE WAREHOUSEMEN'S ASSOCIATION
L. A. Bailey, Secretary, 461 Market St., San Francisco, Calif.

SOUTH CAROLINA ICE MANUFACTURERS' ASSOCIATION
Geo. L. English, Secretary, P. O. Box 603, Columbia, S. C.

SOUTHERN ICE EXCHANGE
Wilshire Riley, Secy.-Counsel, 421 Rhodes Building, Atlanta, Georgia

SOUTHWESTERN ICE MANUFACTURERS ASSO.
P. A. Weatherred, Secy. Connsel, Mercantile Bank Bldg., Dallas, Texas

TENNESSEE ICE MANUFACTURERS' ASSOCIATION
W. E. Harlan, Secretary, Mt. Pleasant Ice Co., Mt. Pleasant, Tenn.

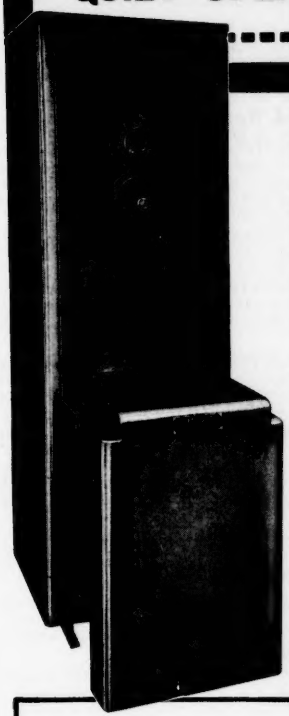
TRI-STATE ASSOCIATION OF ICE INDUSTRIES
L. R. Girton, Secretary, 260 Boyce-Greeley Bldg., Sioux Falls, S. D.

VIRGINIA ICE MANUFACTURERS' ASSOCIATION
H. H. Snyder, Secretary, Alexandria, Va.

WEST VIRGINIA ASSOCIATION OF ICE INDUSTRIES
E. Dana Smith, Secy., Diamond Ice & Coal Co., Charleston, W. Va.

WISCONSIN ASSOCIATION OF ICE INDUSTRIES
Paul F. Hoff, Secretary, 1100 East Locust St., Milwaukee, Wis.

BINKS Type "B"
Forced Draft Cooling Towers give you maximum cooling efficiency
+ plus +
QUIET OPERATION



Special slow speed, quiet operating blower assembly on Binks Type "B" Cooling Towers eliminates noise, making them ideal units for clubs, hotels, restaurants, homes or any inside installations. Also suitable for a wide variety of industrial processes where heat is liberated to circulating water. Cut water cooling costs to almost nothing . . . you can use the same circulating water over and over. Patented design of these towers greatly increases air-to-water ratio without increasing power consumption. The result is greater efficiency and less wear. Highly efficient where natural air movement is restricted . . . they create their own draft. Available in 34 standard sizes.

Binks

Send now for Bulletin No. 35, describing Binks type "B" Forced Draft Cooling Tower in full. State tower capacity required.

THERE'S A BINKS TOWER FOR EVERY COOLING JOB

Binks MANUFACTURING COMPANY

3130-38 Carroll Ave., Chicago 12, Ill.

Need pure ammonia in a hurry?

That clean Mathieson Ammonia is quick on the take-off. A call from you to the nearest of Mathieson's 44 warehouses will bring "Super-Math" in a flash . . . and we do mean "super". It's pure—really pure . . . purged of moisture, non-condensable gases and other undesirables. Every cylinder and valve is thoroughly checked before quick-shipment to you. So if you need pure ammonia promptly, call Mathieson. Swift deliveries in 100- and 150-lb. cylinders.

MATHIESON CHEMICAL CORP.
Mathieson Building Baltimore 3, Maryland

Mathieson
AMMONIA

Ammonia, Anhydrous & Aqua...Caustic Soda
Soda Ash...Bicarbonate of Soda...Liquid
Chlorine...Dry Ice...Chlorine Dioxide...NTH
Products...Fused Alkali Products...Sodium
Chlorite Products...Carbonic Gas...Sodium
Methylate

NEW PLANTS AND IMPROVEMENTS

Information pertaining to proposed new plants utilizing refrigerating equipment, as well as additions, improvements, and rehabilitation of existing plants. News regarding such new plants and additions is invited for publication in this department.

ARKANSAS

Stuttgart, Ark.—The retail sales unit of the Standard Ice Co., has been remodeled. The company also installed coin-operated machines to better serve the public.

CALIFORNIA

Bakersfield, Calif.—Then additional cold storage rooms are being added to the plant of the Kern Ice & Cold Storage Co. at 120 Thirtieth St., near the main line of the Southern Pacific Railroad. The new rooms will be 40 x 60 ft. each and will adjoin the present plant which now consists of 20 rooms. Construction will be of redwood and stucco on a concrete floor and the project will cost approximately $110,000. The new structure is expected to be completed about December 1, according to Harry S. Hicks, manager of the company.

Sacramento, Calif.—An ice storage building costing $20,000 is being erected at Ninth and D Streets by the National Ice and Storage Co.

CANADA

Beamsville, Canada—The Beamsville Growers Co-operative plans a new cold storage, deep freeze and pre-cooling plant.

DELAWARE

Wilmington, Del.—A municipal building permit was granted recently to the Diamond Ice and Coal Co., to build a new $134,000 building at 1600 Jessup St., to house garage and office space, as well as service and storage. The building will be of brick construction with concrete floors.

FLORIDA

Jacksonville, Fla.—The Florida Ice Machine Co. will build a cold storage warehouse at 2481 Dennis St. The warehouse, approximately 150 by 250 ft., will cost $130,000, and will be a commercial cold storage plant for frozen foods only. The new plant is scheduled for completion early next year, according to John W. Patterson, president.

MISSISSIPPI

Gulfport, Miss.—Allbrook Freezing and Cold Storage Plant has been opened at Gulfport Field by Eddie Allbrook. The plant is located in an abandoned warehouse and refrigeration building which was used during the war.

Tupelo, Miss.—Cold storage facilities will be included in a large, modernly designed meat packing plant being constructed by the Mid-South Packers, Inc. The new addition, which is to be completed this year, will provide facilities that will almost triple the size of the present plant.

NEW YORK

New York, N. Y.—Building plans have been filed for erection of an ice manufacturing and ice storage plant at 22 E. 141st Street by Riverton Equities, Inc., owner.

OKLAHOMA

Sand Springs, Okla.—The Sand Springs Ice and Refrigeration Co., recently installed an ice vending machine at their plant, according to Johnny O'Neal, owner.

OREGON

Hillsboro, Ore.—Adolph Mohr is constructing a cold storage and storage building in connection with his company, the Royal Soda Works.

SOUTH CAROLINA

Charleston, S. C.—Freezer Plant, Inc., is taking over the St. Andrew's Freezer Locker and is adding 200,000 lbs. of freezer capacity and zero temperature storage capacity for about 500,000 lbs. of seafood and produce, James A. Hood, president of the new company, announced recently. The plant has been leased with an option to purchase, he said. By adding the new storage capacity, the plant is being converted to a commercial freezing plant.

UTAH

Salt Lake City, Utah—The Utah Ice and Cold Storage Co. is constructing a modern quick freezing plant to replace the three-story storage plant annex, recently destroyed by fire.

Sales and Reorganizations

Nogales, Ariz.—Louis Bilbao recently purchased the Nogales Freezing and Storage Company, 433 Grand Ave. Co-owner of the firm is C. H. Phillips who will serve as manager. The company will engage in the packaging and processing of seafood from the Gulf of California.

Dunkirk, N. Y.—The Lake City Ice & Fuel Co. Inc., as it is now known, was recently purchased by Buell H. and Fred W. Bedford and Wm. R. Knoll and his son, Richard Knoll from the Dotterweich family who founded a brewery in 1852. During the ice famines of the 1890's the brewery put in a refrigeration system and later installed an ice making plant.

Ardmore, Okla.—The Crystal Ice Co. has purchased the Ardmore Ice Service from George Dashner of Ardmore and Mrs. R. A. Bond of Sulphur, Okla. In the past, ice for the service company was manufactured in Sulphur.

Houston, Tex.—The idle Burress & Rogers ice plant at Airline and North Main has been sold by Mr. and Mrs. J. D. Burress to G. O. and Floyd Brinson for more than $100,000. The Brinsons, who are brothers, are reconditioning the plant at a cost of around $35,000. The plant, which has a daily output of 40 tons, was built in 1929.

Fires and Accidents

Yuma, Ariz.—The Pacific Fruit Express icing dock burned recently at three different places, causing damage estimated at $100,000. More than 800 ft. of the dock was destroyed and seven box cars were destroyed or damaged.

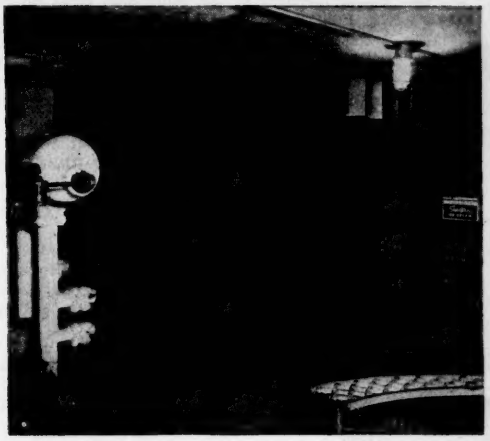
Greenville, Ohio—The W. H. Eller Ice Co. was recently damaged by fire cutting off the city's major source of artificial ice. Owner Waldo Eller estimated the loss at $15,000.

Clearfield, Utah—Damage estimated at from $8,000 to $10,000 was caused by fire at the Sessions Cold Storage Plant here.

New Incorporations

San Francisco, Calif.—Continental Cold Storage Co. Inc., has been incorporated with 10,000 shares, par value $1.00 each; directors, Jerome J. Cahill, Frederick J. Woelflen, M. Carroll, Alan Dohrmann and W. C. Roberts.

Nebraska City, Nebr.—The Nebraska City Ice Co. has filed articles of incorporation, to buy, sell, manufacture and distribute artificial ice. The firm is capitalized at $15,000 and the incorporators are Walter Perkins, James L. Taylor and Joyce P. Taylor.



Do you want COST - REDUCING Refrigeration?

The Niagara "No Frost" Method saves you from any loss, delay, shut-down, or diminished efficiency from frost on your refrigerating coils, at any time. You always get the full capacity that you paid for when you bought your refrigerating plant.

See how this means money savings. You run with higher suction pressures and lower head pressures, saving power. Your wear and tear and maintenance is lower; you save the loss of production and the labor used in defrosting periods. You save the power that is wasted when refrigeration is supplied through coils that are frost-coated.

The Niagara "No Frost Method" is not just a means of defrosting. It is a means of operating refrigeration without the formation of frost at any time, reducing costs, quickly paying for itself.

There are hundreds of successful "No Frost" users who say it is saving money, increasing production and improving quality for them every day . . . in every type of refrigeration installation requiring temperatures below freezing . . . in food freezing, ice cream, cold storage and in special industrial applications.

Write for Niagara Bulletin No. 105
for further information

NIAGARA BLOWER COMPANY
Over 35 Years of Service in Industrial Air Engineering
Dept. IR 405 Lexington Ave., New York 17, N. Y.
District Engineers in Principal Cities

INDUSTRIAL COOLING HEATING • DRYING
NIAGARA
HUMIDIFYING • AIR ENGINEERING EQUIPMENT

STURDY-BUILT ICE VENDING STATIONS Cut Costs.. Cure "Off-Season" Slump

Surveys prove automatic ice vending captures 27% "plus" business from occasional users.

According to recent surveys 27% of the ice sold through STURDY-BUILT Refrigerated Ice Vending Stations is purchased by occasional ice users. This represents a *plus* market hitherto untapped by the ice industry.

The same surveys reveal that 45% of the sales made by STURDY-BUILT refrigerated ice vending stations are made between the hours of 4:00 and 8:00 P. M. . . . strictly "after hour" business lost entirely to the ice manufacturer or distributor who fails to provide dependable 24 hour automatic service.

Progressive ice distributors throughout the nation plan to maintain volume . . . even through the "off season" . . . with STURDY-BUILT refrigerated Ice Vending Stations. They plan to capture the 27% volume, which they have never enjoyed, increasing winter sales by at least that much. They see in automatic ice vending an opportunity to cut excessive distribution costs and stretch profit margins by offering customers dependable "round the clock" service.

REFRIGERATED STURDY-BUILT ICE VENDING STATIONS
F. B. DICKINSON & CO.
Highland Park Station
Des Moines, Iowa

S&S ICE VENDING MACHINES
S & S VENDING MACHINE CO.
670 Lincoln Avenue
San Jose, California

OBITUARY

MICHAEL M. MAY, superintendent of the Georgia Ice Co., of Savannah, Ga., died July 29 in the Savannah Hospital after a long illness. He was 80 years old. Mr. May had been identified with the ice and fuel business since moving to Savannah in 1910. For many years he was a partner in the business of May-Peoples Ice & Fuel Co., with which business he was still identified at the time of his death.

PERCY EDWARD HASLETT, vice president of the Haslett Warehouse Co., San Francisco, Calif., died August 25. At the ripe age of 83 years, Mr. Haslett remained active up to the time of his death.

FRANK BOLES, manager of the south side plant of the Polar Ice & Fuel Co., Indianapolis, Ind., passed away Monday, August 8, at the Methodist Hospital. Born in Marion, Ind., Mr. Boles was with the Polar Ice & Fuel for 45 years, serving first in Marion, and the last 13 years in Indianapolis. Surviving are his widow, his mother two sisters and three brothers.

CHARLES A. ASHBEY, a life-long resident of Bloomfield, N. J., who conducted an ice business there until his retirement fifteen years ago, died September 4, at Montclair Community Hospital. He was 82 years old.

HERBERT B. EATON, prominent fruit grower of Youngstown, N. Y., and manager and treasurer of the Youngstown Cold Storage Co. for many years, died September 6. He is survived by his wife and a daughter.

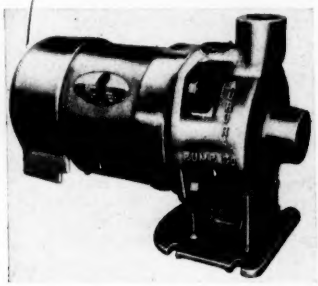
NEW AND IMPROVED EQUIPMENT

MACHINERY-APPLIANCES-PROCESSES

Information contained in this department is furnished by the manufacturer of the article described and is not to be construed as the opinion of the Editor.

New Line of Pumps

A LINE of side suction, close coupled pumps designed for small capacity (5 to 75 GPM), medium head (0 to 100 feet head) duty —for operation at speeds from 1750 to 3500 RPM depending upon head and capacity required is being produced by The Aurora Pump Co., Aurora, Ill. They are available for V-belt drive or with flexible coupling, the pump and motor being installed on common base.



Aurora Type JMC (close coupled) side suction pump.

These pumps are intended for a broad range of duties in general service and for use as an integral part of equipment manufacturer's product, such as air conditioning units, cooling towers, evaporator coolers, milk coolers, hot water circulators, etc.

They are available in sizes 1 in., 1¼ in., and 1½ in. in bronze fitted, all iron or all bronze construction. Casings are vertically split; support feet cast and motor support are cast integral with pump casing. Suction is on end; discharge vertical. Casing wearing ring is standard construction. Mechanical seal is located in packing cover and is standard equipment. Impeller is of high grade bronze, of enclosed type and balanced. Ball bearings built into motor of NEMA specifications with stainless steel shaft.

New Spray Nozzle

A NEW spray nozzle which operates on a radically different principle has been announced by the manufacturer, the Bete Fog Nozzle Co. of Greenfield, Mass. The new line of Bete spray nozzles, on which several patents are pending, has a unique spiral design that produces a

New Bete Fog Nozzle.

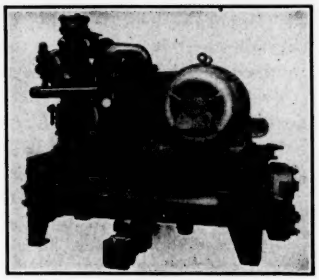
finer atomization yet is practically non-clogging, according to the manufacturer.

The new nozzles shear from a single, high velocity jet a continuous film which readily breaks up into uniformly fine particles at relatively low pressures. No vanes nor whirl discs are required with this new type of nozzle, as they are with most conventional nozzles.

The Bete Company is now producing the new type nozzle in various spray patterns and with flow rates from one-quarter to 100 gallons per minute. They can be used for all kinds of spray problems where a fine break-up at low pressures is required.

Low Pressure Refrigerating Unit

A new low pressure refrigerating unit with new Eclipse compressors of 2, 3, 4 and 6 cylinders is announced by the Frick Co., Waynesboro, Pa. A two-page circular has been issued giving specifications and illustrating this new unit. The entire unit is

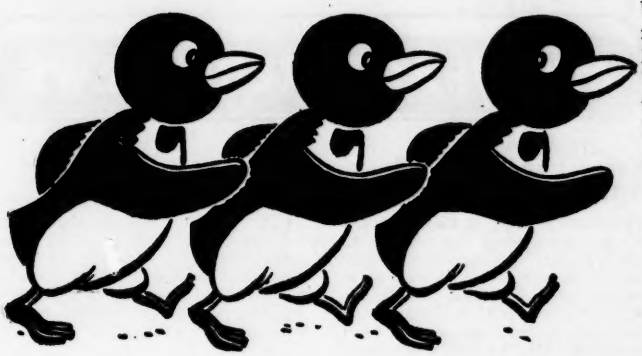


New Frick "Eclipse" Low Pressure Refrigerating Unit.

finished in waterproof maroon enamel. Standard equipment includes all items except capacity controls plus first charge of oil, piston ring guide, valve assembly lifting device, foundation bolts and necessary blue print. The circular includes a table giving quick information covering all specifications for this unit running 850 rpm.

Always UNIFORM

...and Guaranteed Minimum 99.98% Anhydrous Ammonia



Use Du Pont "National" Ammonia for peak performance—all year round. It's pure, uniform, always dependable. You get prompt delivery from distributing points all over the country! E. I. du Pont de Nemours & Co. (Inc.), Ammonia Dept., Wilmington 98, Del.

BRANCH OFFICES:

- 350 Fifth Avenue, New York 1, N. Y.
- Tacony and Vankirk Sts., Philadelphia 24, Pa.
- 7 S. Dearborn St., Chicago 3, Illinois
- 818 Olive St., St. Louis 1, Missouri

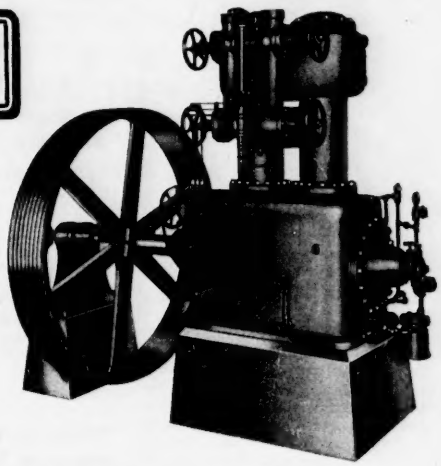
DU PONT
BETTER THINGS FOR BETTER LIVING THROUGH CHEMISTRY

HELP US SERVE YOU BETTER • RETURN CYLINDERS PROMPTLY

NATIONAL

CYLINDER ANHYDROUS AMMONIA

Sterling DEPENDABLE REFRIGERATION



The phrase "STERLING DEPENDABLE REFRIGERATION" is more than a slogan—it's a fact.

Built with rugged strength for endurance, with advanced design for efficiency and economy of operation, STERLING Ammonia Compressors are the product of more than fifty years of "know how" in the manufacturing of refrigeration machinery and equipment.

A complete range of sizes insures the correct compressor for each application.

Deliveries are, at present, current—most models of compressors are available from stock.

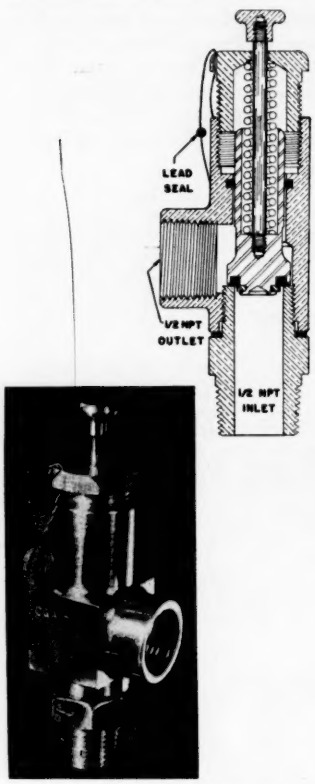
For complete information, see your nearest STERLING distributor, or write the factory.

REYNOLDS MANUFACTURING CO.

SPRINGFIELD *"Builders of Fine Refrigeration Equipment"* **MISSOURI**

New Freon Relief Valve

TO BEAT the problem of costly Freon leakage, engineers at Black, Sivalls and Bryson, Inc. have designed a Freon relief valve that seats tightly even after repeated "popping." This new valve, the CGA½-2, has been thoroughly tested and found acceptable by the American Society of Mechanical Engineers.



Freon relief valve designed by Black, Sivalls and Bryson, Inc.

Popping tests, in which a single valve was popped by Freon pressure as many as 200 times, have found the valve Freon-tight after each closing.

The possibility that bits of dirt or scale may lodge beneath the valve plug and keep it from closing tightly makes it wise, where large amounts of Freon are involved, to use a Safety Head rupture disc with the valve. If the valve should leak, the rupture disc will temporarily hold the gas in the system.

The CGA½-2 valve was designed to meet two major requirements: To assure a tight-seating valve and to permit the installation of a Safety Head rupture disc on the outlet of the valve, without impairing the proper opening of the valve. The new BS&B Freon relief valve meets these requirements.

Refrigerator Door Hardware

A 16-page bulletin, describing and illustrating its line of refrigerator door hardware, has been issued by The Butcher Boy Cold Storage Door Co., Chicago, Ill. Instructions for ordering and terms are included. This line includes specially designed lag screws and carriage bolts, main door fasteners, hinges for doors and windows, automatic door closers, bumpers, casters, locks, conveyors, gaskets and other cold storage door applications. A copy is available from the company, 170 N. Sangamon St., Chicago, Ill.

MANUFACTURERS' NEWS

Kehoe Handles Varied Refrigerating Equipment

ROBERT P. KEHOE Machinery Co. Inc., Ridgefield Park, N. J., which recently announced consolidation of its offices and warehouses in its own modern building at 6 Eucker St., has been in business going on 30 years, all of that time having been located at 42nd St. and Fifth Ave., New York City.

The business of the company consists in the selling of all kinds of reconditioned second-hand refrigerating equipment strictly in the line of ice-making plants, ammonia compressors, valves and all pertinent parts in the ice-making industry. The company is also now fabricating its own new ice plants in sizes 4 to 5, 8 to 10, 18 to 20 and 25 to 38 tons. A complete line of new ice-making equipment of all kinds is handled, including ammonia compressors, condensers, brine coolers and valves.

McDougall Joins Kennard Corp.

THE appointment of Ben M. McDougall as assistant sales manager has been announced by the Kennard Corp. St. Louis, Mo. An engineering graduate of Southwestern Louisiana Institute and charter member of New Orleans ASRE Section, Mr. McDougall is well-known in the refrigerating, heating and air conditioning trade. He will augment Kennard's growing engineering-sales organization in his new duties.

Westcott Changes Name to Water Chemists

THE name of Ralph M. Westcott Co., Los Angeles, Calif., has been changed to Water Chemists, Inc. At the same time Richard D. Pomeroy, Ph.D. and Ralph M. Westcott have announced their partnership association as consulting engineers and chemists. The company specializes in the servicing of the water side of water cooled refrigeration to meet problems involving scale, algae and corrosion.

Creamery Package Advances Spencer

ACCORDING to a recent announcement from E. B. Lehrack, vice-president of The Creamery Package Mfg. Co., Chicago, John L. Spencer has been promoted to the managership of the firm's Buffalo, N. Y. Branch.

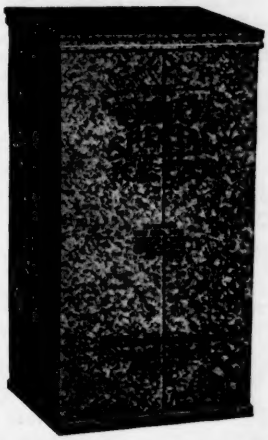
John L. Spencer

"Jack" Spencer started with Creamery Package in 1941 following nine years of refrigeration work including five as head of Spencer Air Conditioning Corp., Buffalo, and four as New England sales engineer for the Niagara Blower Co. He first served CP as a Chicago branch sales engineer; later worked on the war project facilities for CP's Lake Mills, Wis. factory after which he joined the U. S. Navy. He rejoined Creamery Package and was appointed assistant manager of the Buffalo Branch in 1946.

During the war he was a Lt. Commander attached to the Bureau of Ships, Washington, D. C., where he served as assistant officer in charge of construction and conversion of the Navy's refrigerated cargo vessels and ammunition ships.

Mr. Spencer received his early education at Orchard Park, N. Y., Buffalo Technical High School, and was graduated from the University of Michigan in 1932 with a B.S. degree in mechanical engineering. He is a member of The American Society of Refrigerating Engineers and is at the present time chairman of the Technical Committee of the Society's Buffalo Chapter.

OHIO SPECIAL ICE CANS



Double Riveted
Welded
Integral Tube Cans
Arctic Pownall Cans
Can Baskets
Condenser Trough

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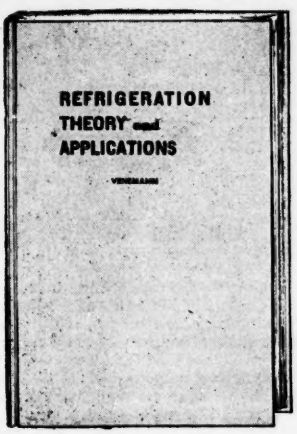
Industrial Trucks
and Trailers

THE OHIO GALVANIZING & MFG. CO.
NILES — Established 1902 — OHIO

Your Best Tool is *Technical Knowledge*



REFRIGERATION THEORY and APPLICATIONS

(Second Edition, 1946)

WHETHER you OPERATE A PLANT, INSTALL, SERVICE, SELL refrigeration equipment, or are a STUDENT of refrigeration, this book gives you the basic facts and principles involved in the processes of mechanical refrigeration. Now, more than ever before, today's conditions demand your thorough knowledge and understanding of these pertinent facts.

Too often "force of habit" methods make the refrigeration man lose sight of the knowledge that contributes so greatly to a complete and thorough understanding of efficient operation.

This new book includes refrigeration THEORY — PRACTICE — APPLICATIONS — set down in easy-to-understand language for both the student and the engineer — practical and authentic information that will help you diagnose, correct conditions, operate and design an efficient installation.

336 pages—6x9 inches
17 Fold-in Inserts
90 Illustrations — 156 Problems

No other book offers such a comprehensive treatise on the refrigeration theory as applied to the practical uses and applications. An indispensable reference for the student engineer and practical man.

Postpaid **$4.00**

CONTENTS: The Compression Refrigeration System or Electric Refrigeration ● Refrigerant Charts and Their Uses ● Air & Water Vapor Mixtures ● Instructions for Starting Plants in Operation ● Refrigerants ● Calculations of Sample Test Results ● Estimating Plant Loads ● Analysis of Plant Performance ● Performance of Compressors ● Property Changes During Test ● Heat Exchangers—Liquid Cooling ● Energy Transformation ● Miscellaneous Methods of Refrigerating ● Automatic Controls ● Methods of Accommodating Variable Loads ● Air As a Primary Refrigerant ● Heat Exchangers for Cooling Air ● Plant Analysis via the Theoretical Cycle ● Heat Exchangers—Condensers ● Specifications for Refrigeration Plant.

NICKERSON & COLLINS CO.
433 N. Waller Ave. ● CHICAGO, 44

Dubois Promoted By Creamery Package

THE promotion of Charles Dubois to managership of the firm's Salt Lake City branch has been announced by E. B. Lehrack, vice-president of the Creamery Package Mfg. Co., Chicago. Mr. Dubois succeeds D. G. "Jack" Perryman, who was transferred to the Creamery Package Buffalo, N. Y. branch in the capacity of assistant manager.

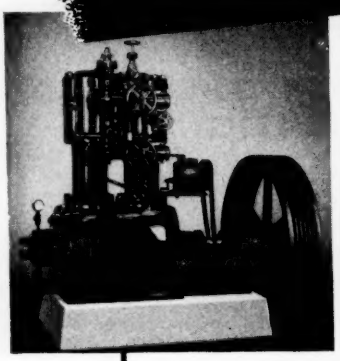
"Chuck" Dubois started with Creamery Package in 1945 as a Sales Engineer with the Creamery Package Seattle branch. He worked for Kristoferson Dairy, Seattle, Wash.; served as plant superintendent at Calvert Dairy, Richmond, Mo. and field superintendent for Harding Cream Co., Kansas City, Mo.

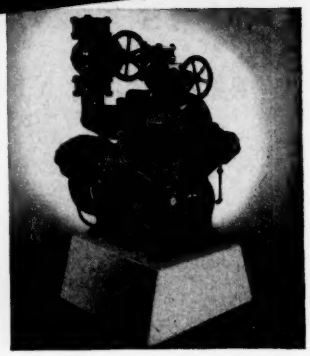
He assisted the Kansas State Board of Health to establish a Standard Milk Ordnance for cities throughout Kansas. He also headed up the division of sanitation at Albuquerque, New Mexico where he established the Standard Milk Ordnance for that city.

Charles Dubois

BEFORE YOU INVEST IN REFRIGERATION EQUIPMENT INVESTIGATE

Ammonia Compressors and Boosters





For more than half a century, CP Refrigeration has stood for dependable, economical performance.

CP Engineers, backed by an extensive line of Vertical two-cylinder Compressors, Self-contained Marine Units, and Multi-cylinder Compressors and Boosters, are especially qualified to cooperate in planning refrigeration systems for a wide variety of services. A nation-wide CP organization gives owners of CP Refrigeration Equipment the important advantage of one source of complete supply and service.

THE Creamery Package MFG. COMPANY

General and Export Offices: 1243 W. Washington Blvd., Chicago 7, Illinois
Branches in 21 Principal Cities
CREAMERY PACKAGE MFG. CO. OF CANADA, LTD., 367 King Street West, Toronto 2, Ontario
THE CREAMERY PACKAGE MFG. COMPANY, LTD., Avery House, Clerkenwell Green, London, England

Baker Moves Omaha Equipment

PLANS for the consolidation of all manufacturing facilities of the Baker Refrigeration Corp. at its Eastern Division, located at South Windham, Me., have been announced by T. S. Pendergast, president of the corporation, after a meeting of Baker's Board of Directors. Mr. Pendergast states: "These plans follow a long-range program, started in 1947, designed to place the company in a strong competitive position in the air conditioning and refrigeration fields. The first step was the purchase of a plant at South Windham, within the Greater Portland industrial area with its ample transportation facilities to domestic and foreign markets. The company transferred its general offices and certain manufacturing operations from its plant at Omaha, Nebr. and was able immediately to broaden its line of refrigeration compressors and condensing units.

"The second step involves complete transfer of all manufacturing to the Greater Portland area. Negotiations have been completed for approximately 35,000 square feet of additional manufacturing floor space, where compressors and condensing units will be machined, assembled, tested and shipped. The present plant at South Windham will be utilized in the manufacture of bases, frames, belt guards and other component parts formerly purchased from outside sources. This move will permit closer quality control and will eliminate delays and expense of operating two plants at points widely separated."

Baker Refrigeration Corp. is one of the oldest companies in the refrigeration industry. Founded in 1905, it has been famous for over 40 years as the Baker Ice Machine Company. Change of name was made in March, 1949, as one of the steps to identify company activity in the wider fields of air conditioning and commercial refrigeration. In line with this program the company has broadened its line of products. It now makes compressors and condensing units from ½ to 60 hp. for Freon, and from 2 to 125 hp. for Ammonia.

During 1948-9 the company has added several "packaged" units. In air conditioning it offers Bakeraire in 3, 5, 7½ and 10 ton; and Central Air in 5 to 40 tons.

it's even COLD enough for me

WITH THAT PURE AND DRY

ARMOUR'S ANHYDROUS AMMONIA

Armour's Anhydrous Ammonia is pure and dry . . . free of moisture and non-condensable gases. And to insure trouble-free operations, every cylinder is tested and checked before shipping to give positive assurance of fine quality.

Remember, too, that fast shipment is an Armour byword. In fact, many customers receive their Armour's Anhydrous Ammonia the day it is ordered. 65 conveniently-located stock points are your assurance of receiving prompt shipment of Armour's Anhydrous Ammonia in either 50, 100 or 150 pound cylinders where you want it, when you want it and fast.

Please return empty cylinders!

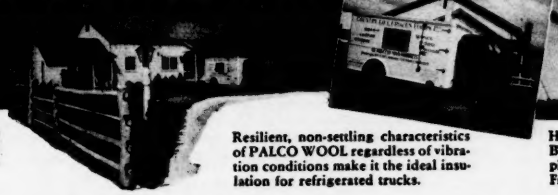
ARMOUR *Ammonia Division*

Armour and Company
1355 West 31st Street • Chicago 9, Illinois
North Bergen, New Jersey

FROM PROCESSING TO POINT OF SALE

PALCO INSULATION WOOL PROTECTS FROZEN FOODS

Country Life Frozen Foods central processing plant at Westbury, Long Island, N.Y.



Resilient, non-settling characteristics of PALCO WOOL regardless of vibration conditions make it the ideal insulation for refrigerated trucks.

Huntington Station Branch distribution plant for Country Life Frozen Foods.

To maintain low temperatures in processing plant, refrigerated transfer trucks, and final branch distribution plants, Country Life Frozen Foods, Inc., of Westbury, Long Island, New York, depends upon PALCO WOOL INSULATION. Extremely high thermal efficiency of .255 BTU insures lower operating costs and more perfect product preservation, resulting in higher margin of profit! Write today for your copy of the Frozen Food Locker Plant Plan and Construction Manual.

FLAMEPROOF INSULATION FROM DURABLE REDWOOD BARK

THE PACIFIC LUMBER COMPANY

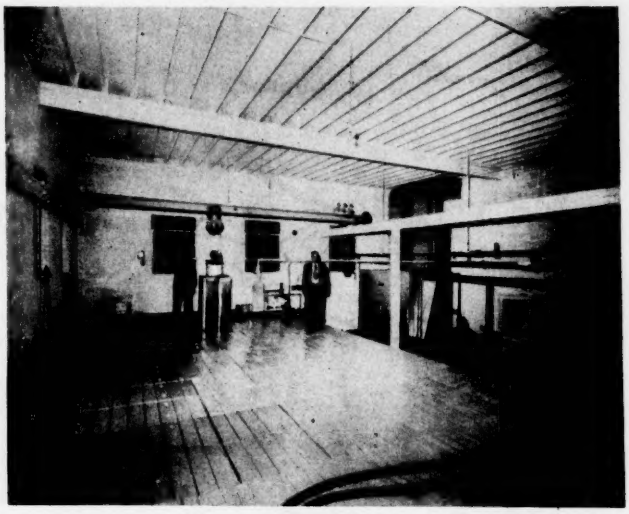
100 BUSH STREET, SAN FRANCISCO 4, CALIFORNIA
5225 WILSHIRE BLVD., LOS ANGELES 36, CALIF. 35 E. WACKER DRIVE, CHICAGO 1, ILL.

NATURE'S OWN INSULATION FROM THE AGE-OLD REDWOODS

New Ice Plant Uses Marlo Condenser

A MODERN 12 ton ice plant was installed recently for the High Point Ice & Coal Co. of High Point, N. C., by the Refrigeration Engineering Corp., Philadelphia. RECO designs and manufactures complete ice plants and ice plant supplies.

A Marlo EC 70 Evaporatve Condenser was used in the High Point installation. This particular size was chosen to enable the operator to achieve low head pressures and the consequent savings in operating costs. A 6x6 Worthington, two cylinder vertical, single acting ammonia compressor was employed in the system. The new ice plant equipment produces from 12 to 14 tons per day.



Interior view of the High Point Ice & Coal Co. plant, High Point, N. C. The Marlo EC 70 evaporative condenser which was used in the installation can be seen in the background.

Marsh Acquires Electrimatic

THE purchase of the Electrimatic Valve Division of Simoniz Co. of Chicago is announced by Jas. P. Marsh Corp. of Skokie, Ill. All Electrimatic valves will now be manufactured and distributed by the Marsh Corp. The Electrimatic line includes pressure actuated condensing water regulators for control of cooling water through condensers, solenoid stop valves for larger cooling systems, suction throttling valves, and back pressure regulators for evaporators.

Commenting on the acquisition of the Electrimatic line, Jas. Emmett, Jr., sales manager of Jas. P. Marsh Corporation, explained that the purchase was in keeping with an established policy of adding products which can supplement the Marsh line, increasing manufacturing and distribution efficiency, and thus increasing the effectiveness of the Marsh service to industry.

MARTOCELLO ICE PICKS

"Cost You Less To Buy The Best"

Immediate Delivery on Plain Handle Ice Picks

BLADES

of High Carbon Tool Steel, accurately tempered to give you maximum use.

HANDLES

of Sound, Clear Hard Wood with Protective Flexible Lacquer Coating.

FERRULES

of Pressed Steel securely registered on Handle and Plated to Resist Corrosion.

PRICES ON PLAIN AND PRINTED HANDLES HAVE BEEN REDUCED! WRITE TODAY FOR NEW PRICES.

Jos. A. Martocello & Co. 229-231 NORTH 13th STREET PHILADELPHIA 7, PA.

"Serving the Ice Industry Since 1916" *"There is no Substitute for* MARTOCELLO QUALITY"

Henry Valve Appoints McCahill

THE appointment of Raymond J. McCahill as field engineer for Southern Illinois, Indiana, Missouri and Kansas has been announced by

Raymond J. McCahill

Henry Valve Co., Melrose Park, Ill. A Navy veteran and a member of the Henry sales organization since August, 1948, Mr. McCahill received his engineering education at Northwestern University and is a graduate of the Illinois Institute of Technology, class of 1948.

PITTSBURGH
Air Pressure Tested COILS

Electrically welded, continuous; Air-Pressure-Tested while submerged in water. Built to your specifications. Send for new Coil Data Book and let us quote.

Welded Headers—Welded Ammonia Receivers
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CUBE & CRUSHED ICE BAGS
"COOL-RITE" MILK CASE BAGS
"SNUG-FIT" BELT PURSES
"CANT-LOSE" WALLETS

H. D. EWARD CO.
Patentee & Mfrs., 187 E. Jefferson St., Ft. Wayne 2, Ind

Actual Size
3½ in. square

Price $1.00

HEAD BACK PRESSURE CALCULATOR

The Head-Back Pressure Calculator quickly determines the proper head pressure, for various refrigerants when the suction pressure, room temperature or mean water temperature is known.

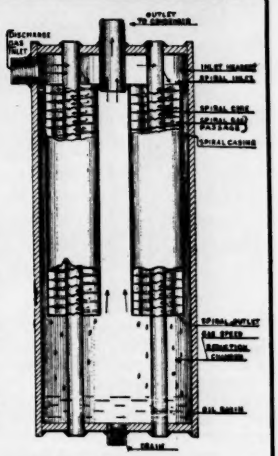
A number of troubles can be detected by comparison of the existing head pressure with what the head pressure should be, but in the past there has been no convenient method available to the engineer to determine what this should be. Such variable conditions as the suction pressure, room temperature, water inlet and outlet temperature, kind of gas used, etc., all enter in determining the proper head pressure.

NICKERSON & COLLINS CO.
433 N. Waller Ave., CHICAGO 44, ILL.

"King Zeero"

OIL SEPARATOR

STOPS OIL FROM ENTERING CONDENSER RECEIVER AND LOW SIDE



Allows operation as was originally intended. Simple in operation — no parts to wear out — no screens, metal wool or any close screens to clog, raise discharge pressures and cut down capacity.

When used in connection with air compressors, water is also separated with the oil.

Built for years of trouble free service. Mechanical details on request.

THE KING ZEERO COMPANY
1447-55 Montrose Ave., Chicago 13, Ill.

NOW IS THE TIME!

- **TO PLAN EXPANSION**
- **TO REPLACE DEFECTIVE COMPONENTS**

Your equipment has had a busy season . . . put it in condition for a bigger and busier season next year. Repair or enlarge with RECO quality replacement parts NOW. Prompt Delivery.

- Ice Tanks
- Tank Tops & Framing
- Storage Room Coils
- Raceway Coils
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- Accumulators
- Dip Tanks
- Brine Agitators
- Can Dumpers
- Can Fillers
- Ice Cans
- Ice Vending Depots
- Can Guides & Retainers
- Liquid Receivers

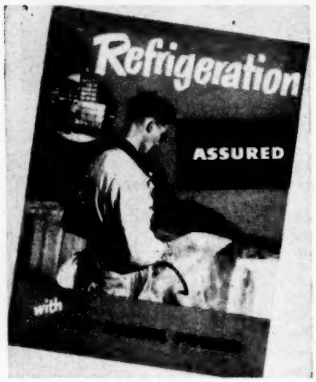
(Refrigeration Engineering Corporation)

RECO PRODUCTS DIVISION
2020 NAUDAIN STREET, PHILA. 46, PENNA.

CATALOGS AND BULLETINS

Diesel Power for Refrigeration Plants

A NEW 8-page booklet, "Refrigeration Assured With 'Cat' Diesel Power," describing the application of "Caterpillar" Diesel Engine and Electric Sets to cold storage and ice plants, has been published by Caterpillar Tractor Co., Peoria, Ill.



Photographs depicting food locker plants, ice storage rooms, a dairy, and a brewing company which depend on "Caterpillar" Diesel power help to convey the story of refrigeration techniques used in ice-making; cold storage of meat, poultry, fish, eggs, fruit, and vegetables; and liquid cooling processes.

The booklet may be secured by requesting Form 12433 from Caterpillar Tractor Co., Peoria 8, Ill., or from "Caterpillar" Dealers throughout the United States and Canada.

New Bulletin on Rotary Positive Blowers

A BULLETIN covering the smaller size Type AF rotary positive blowers, for pressure or suction service, has been issued by Roots-Connersville Blower Corp., Connersville, Ind. These blowers are built in 18 standard sizes, with capacities ranging from 5 to 700 cfm. up to 3 lbs., 5 to 415 cfm. up to 5 lbs., and 15 to 245 cfm. up to 7 lbs., thus offering a wide selection in available stock sizes.

This eight-page bulletin in two colors covers the construction features and operating advantages of rotary positive blowers, and is profusely illustrated, including graphs showing operating characteristics under constant, variable, and multi-speed operation.

All the different driving arrangements are also illustrated, which include single pulley, multiple V-belt, direct-coupled, and integrally mounted motorized variable speed driving unit. Electric motors are usually employed as the prime movers, although gasoline and steam engines are also used in many instances. Recommended accessories, including pressure and vacuum relief valves, inlet muffler-filters, and straight flow mufflers, for suction and discharge lines, also appear.

A selection table, covering the capacity and pressure range of each blower size, is included in the bulletin, together with a dimension print that gives complete details on all standard sizes.

On the back cover are illustrated other Roots-Connersville products, including positive displacement meters, centrifugal blowers and exhausters, inert gas generators, larger size rotary positive units, etc.

New Bulletin on Rust Preventive

A general heavy-duty preventive is described in an 8-page bulletin issued by the Dearborn Chemical Co., Chicago, Ill. This product, known as "No-Ox-Id" is a soft grease-type rust preventive containing a solvent for ease of application and designed for brush application. The bulletin further describes its specific uses and typical uses. Ice and refrigeration plants, it states, have been one of the first industries to recognize the protective qualities of this preventive for condensers and coils and other equipment. The bulletin is profusely illustrated with pictures of ice plants, water tanks, steel mills, and other industrial uses.

New Bulletin on Ice Plant Equipment

A four-page bulletin has been issued by Robert P. Kehoe Machinery Co. Inc., 6 Eucker St., Ridgefield Park, N. J. The bulletin consisting of four pages, lists and illustrates various ice plant equipment including compressors, condensers, ammonia valves and fittings, agitators, receivers, ice cans, brine coolers, cold storage doors, cold storage construction, cork import mineral board, ice crushers and motors. It also includes a diagram of a typical ice-making plant.

Bulletin Describes Tunnel Freezer

A BULLETIN illustrating and describing the Frick tunnel freezer, with both conveyor and push trucks for handling any and all foods has been issued by The Frick Co., Waynesboro, Pa. Foods are frozen in a tunnel, 40 to 60 feet in length, across which very cold air is blown by a series of fans. The bulletin gives a description of this equipment.

MODEL C-2
Approved by Underwriters' Laboratories, Inc.

CONTROL ODORS AND MOLD

GENERAL OZONE *Air Clear* EQUIPMENT OFFERS ADEQUATE PROTECTION FROM MOLD AND ODORS

Use *Air Clear* wherever food commodities are stored to reduce spoilage. General Ozone has a complete line of modern ozonizing equipment plus full service facilities for both old and new types. Write us today for further information.

GENERAL OZONE CORPORATION

17 West Sixtieth St., New York 23, N. Y. 1455 West Congress St., Chicago 7, Ill.

Manufacturers of ozone generating equipment for cold storage ● warehouses refrigerated cars ● walk-in coolers ● air recirculating systems.

Bateman MODEL 50 ICE CRUSHERS
. . . ARE *Safe* AND *Economical*

Capacity 125 to 200 pounds of ice per minute according to size crushed Hopper opening for 50-pound block. Equipped with Oilite Bronze Bearings.

- Drum speed 80 r.p.m.
- Pick and Grate design holds snow to a minimum.
- Adjustable Grate to produce crushed ice in pea to 3 inch size. Adjustment simply requires moving the handle to proper hole.
- In stock for immediate delivery.
- Uniform, efficient operation is the result of three large teeth breaking the blocks and feeding of these chunks into the adjustable grate where sizing is done by 21 teeth.

APPROX. SHIPPING WT.: 400 lbs.
FLOOR SPACE: 38" long x 24" wide

No. 50 Crusher complete less motor, f.o.b.	$212.75
For galvanizing add	20.00
¾ H.P. single phase 1800 R.P.M. Motor	44.00
¾ H.P. Three phase 1800 R.P.M. Motor	40.30

A belt and pulley will be furnished when crusher is ordered without motor.

ALL INQUIRIES ANSWERED PROMPTLY

BATEMAN FOUNDRY & MACHINE CO., INC.
MINERAL WELLS TEXAS

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- B B Brand
AMMONIA

Est. 1858

Immediate shipment and purity of product are two good reasons for specifying Bower Brand. Please keep empty cylinder rotating.

HENRY BOWER CHEMICAL MANUFACTURING COMPANY
29th & GRAY'S FERRY ROAD
PHILADELPHIA, PA.

QUALITY ICE PICKS—Plain—Printed

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Reports, Appraisals and Management

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REFRIGERATION SPECIALISTS
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Only the Highest Quality Merchandise and efficient service necessary for the proper and profitable operation of your business. Write for our 1949 catalog.

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LA PORTE, INDIANA

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SERV-ICE
TRADE MARK REG. U.S. PAT. OFF.
Products
ICE TOOLS AND SUPPLIES

WE CONTINUE YEAR AFTER YEAR
to make the kind of Ice Picks that will give YOUR customers satisfaction and build up GOOD WILL FOR YOU.

PRICE UPON REQUEST

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WOLF-LINDE
Est. 1880
"THE OLDEST NAME IN REFRIGERATION"

EVAPORATOR PRESSURE CONTROLS

Sizes ¾" to 6" for use with all refrigerants in pressure ranges from 20" vacuum up to 80 p.s.i.

Manufactured and Sold by
DERSCH, GESSWEIN & NEUERT, Inc.
4849 West Grand Avenue Chicago 39, Illinois

IS YOUR REFRIGERATION SYSTEM *FREE* OF OIL?
IF NOT YOU HAVE A JOB FOR A
REX
EXTRACTOR

Removes liquid oil vapor from gas streams, efficiently and economically with a minimum of pressure drop.

Oil in the condensers and room coils forms a film, stopping the flow of ammonia gas and reducing the proper heat transfer as much as 20%. This raises the horsepower consumption and lowers the compressor capacity.

A Rex Extractor will keep this oil out of the system to give you maximum capacity — lower operating costs.

Write today for full details.

REX ENGINEERING & SALES CO.
Oklahoma City, Oklahoma
BOX 5141

THE BUYERS

INDEX TO ADVERTISEMENTS OF THESE FIRMS—PAGE 80

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Vogt Machine Co., Henry, Louisville, Ky.

AIR AGITATING SYSTEMS AND FITTINGS
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.

AIR CIRCULATORS
Reynolds Electric Co., River Grove, Ill.

AIR COMPRESSORS
Baker Refrigeration Corp. So. Windham, Maine
Frick Co., Waynesboro, Pa.

AIR CONDITIONING EQUIPMENT
Baker Refrigeration Corp. So. Windham, Maine
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Niagara Blower Co., New York, N.Y.

AIR PURIFYING EQUIPMENT
General Ozone Corp., Chicago, Ill.

AMMONIA COMPRESSOR VALVES
Frick Co., Waynesboro, Pa.
Voss, Inc., J. H. H., New York, N. Y.

AMMONIA COMPRESSORS
Baker Refrigeration Corp. So. Windham, Maine
Creamery Package Mfg. Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc. Chicago, Ill.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Reynolds Mfg. Co., Springfield, Mo.
Vogt Machine Co., Henry, Louisville, Ky.

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Dersch, Gesswein & Neuert, Inc. Chicago, Ill.

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Voss, Inc., J. H. H., New York, N. Y.

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Martocello & Co., Jos. A., Philadelphia, Pa.

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Armour Ammonia Div., Armour & Co., Chicago, Ill.
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Bower Chemical Mfg. Co., Henry, Philadelphia, Pa.
Mathieson Chemical Corp., Baltimore, Md.
National Ammonia Div., DuPont, Wilmington, Del.

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Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

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Acme Industries, Inc., Jackson, Mich.
Baker Refrigeration Corp. So. Windham, Maine
Creamery Package Mfg. Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc. Chicago, Ill.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
National Pipe Bending Co., New Haven, Conn.
Pittsburgh Pipe Coil & Bending Co., Pittsburgh, Pa.
Rempe Company, Chicago, Ill.
Reynolds Mfg. Co., Springfield, Mo.
Vogt Machine Co., Henry, Louisville, Ky.

AMMONIA VALVES & FITTINGS
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Shank Co., Cyrus, Chicago, Ill.

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Armstrong Machine Works, Three Rivers, Mich.
Baker Refrigeration Corp. So. Windham, Maine
Frick Co., Waynesboro, Pa.
Phillips & Co., H. A., Chicago, Ill.
Rex Engineering & Sales Co. Oklahoma City, Okla.
Reynolds Electric Co., River Grove, Ill.

BAGS, ICE
Union Bag & Paper Corp., New York, N. Y.
United Ice Supply Co., Boston, Mass.

BAGS, WATERPROOF PAPER
Union Bag & Paper Co. New York, N. Y.

BEER COOLERS
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

BLOWERS
Frick Co., Waynesboro, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.
Roots-Connersville Blower Corp., Connersville, Ind.

BOILERS
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

BOILER TUBES
Byers Co., A. M., Pittsburgh, Pa.

BOOKS—TECHNICAL
Nickerson & Collins Co., Chicago, Ill.

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BRINE CIRCULATORS
Creamery Package Mfg. Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.
Reynolds Mfg. Co., Springfield, Mo.
Roots-Connersville Blower Corp., Connersville, Ind.
Vogt Machine Co., Henry, Louisville, Ky.

BRINE COOLERS
Acme Industries, Inc., Jackson, Mich.
Baker Refrigeration Corp. So. Windham, Maine
Dersch, Gesswein & Neuert, Inc. Chicago, Ill.
Frick Co., Waynesboro, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Refrigeration Engineering Corp., Philadelphia, Pa.
Reynolds Mfg. Co., Springfield, Mo.
Vogt Machine Co., Henry, Louisville, Ky.

BRINE SPRAY COOLING
Acme Industries, Inc., Jackson, Mich.
Frick Co., Waynesboro, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.

CAN DUMPS
(See Dumps, Can)

CAR ICING EQUIPMENT
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.

COAL HANDLING MACHINERY
Gifford-Wood Co., Hudson, N. Y.

COILS
Acme Industries, Inc., Jackson, Mich.
Byers Co., A. M., Pittsburgh, Pa.
Chicago Nipple Mfg. Co. Chicago, Ill.
Creamery Package Mfg. Co., Chicago, Ill.
Howe Ice Machine Co., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Pittsburg Pipe Coil & Bending Co., Pittsburg, Pa.

COLD STORAGE CONSTRUCTION
Armstrong Cork Co., Lancaster, Pa.
Frick Co., Waynesboro, Pa.
Mundet Cork Corp., Brooklyn, N. Y.
Refrigeration Engineering Corp., Philadelphia, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

COLD STORAGE DOORS
Butcher Boy Cold Storage Door Co., Chicago, Ill.
Jamison Cold Stge. Door Co., Hagerstown, Md
Refrigeration Engineering Co., Minneapolis, Minn.

COMPRESSORS
(See Ice Making and refrigerating Machinery)
(See Air Compressors)

CONDENSERS
Acme Industries, Inc., Jackson, Mich.
Baker Refrigeration Corp. So. Windham, Maine
Creamery Package Mfg. Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc. Chicago, Ill.

Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Co., Inc. R. P., Ridgefield Park, N. J.
King-Zeero Co., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Pittsburgh Pipe Coil & Bending Co., Pittsburgh, Pa.
Reynolds Mfg. Co., Springfield, Mo.
Vogt Machine Co., Henry, Louisville, Ky.

CONSULTING ENGINEERS
Greene, Van R. H., New York, N. Y.
Ophuls & Associates, Fred, New York, N. Y.

CONVEYORS
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.

COOLING TOWERS
Binks Mfg. Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.

CORK INSULATION
Armstrong Cork Co., Lancaster, Pa.
Mundet Cork Corp., Brooklyn, N.Y.

COUPON BOOKS
Index Coupon & Supply Co., La Porte, Ind.
United Ice Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

COVERINGS (PIPE AND BOILERS)
American Hair & Felt Co., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa.
Mundet Cork Corp., Brooklyn, N.Y.

CYLINDERS (GAS & LIQUID)
Byers Co., A. M., Pittsburgh, Pa.

DIESEL ENGINES
Caterpillar Tractor Co., Peoria, Ill.

DIP TANKS AND CAN BASKETS
Frick Co., Waynesboro, Pa.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Martocello & Co., Jos. A., Philadelphia, Pa.
Ohio Galvanizing & Mfg. Co., Niles, Ohio
Refrigeration Engineering Corp., Philadelphia, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

DRIVES, TRANSMISSIONS
Frick Company, Waynesboro, Pa.
Link-Belt Co., Chicago, Ill.

DUMPS, CAN
Frick Co., Waynesboro, Pa.
Gifford-Wood Co., Hudson, N. Y.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Martocello & Co., Jos. A., Philadelphia, Pa.
Ohio Galvanizing & Mfg. Co., Niles, Ohio

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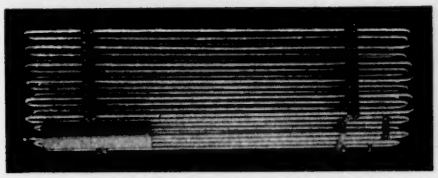

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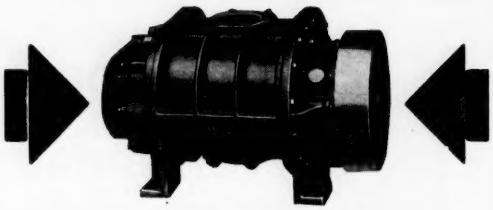

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THE BUYERS

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Refrigeration Engineering Corp., Philadelphia, Pa.
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Vogt Machine Co., Henry, Louisville, Ky.

ELEVATING & CONVEYING MACHINERY
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.

ENGINEERS AND ARCHITECTS
(See Architects and Engineers)

ENGINES
Caterpillar Tractor Co., Peoria, Ill.
Frick Co., Waynesboro, Pa.

EVAPORATIVE CONDENSERS
Niagara Blower Co., New York, N.Y.

EVAPORATORS
Acme Industries, Inc., Jackson, Mich.
Creamery Package Mfg. Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Niagara Blower Co., New York, N.Y.
Vogt Machine Co., Henry, Louisville, Ky.

FEED-WATER HEATERS
National Pipe Bending Co., New Haven, Conn.
Vogt Machine Co., Henry, Louisville, Ky.

FIBERGLAS
Armstrong Cork Co., Lancaster, Pa.

FIELD ICE SAWS
Gifford-Wood Co., Hudson, N. Y.
United Ice Supply Co., Boston, Mass.

FILTERS, WATER
Frick Co., Waynesboro, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.

FIN COILS
Acme Industries, Inc., Jackson, Mich.
Howe Ice Machine Co., Chicago, Ill.
Rempe Company, Chicago, Ill.

FOOD FREEZING EQUIPMENT
Baker Refrigeration Corp. So. Windham, Maine
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

FROZEN FOOD LOCKERS
Knickerbocker Stamping Co., Parkersburg, W. Va.
Rempe Company, Chicago, Ill.

FUEL OIL PRE-HEATERS
National Pipe Bending Co., New Haven, Conn.

GAS AND OIL ENGINES
Caterpillar Tractor Co., Peoria, Ill.

HAND TRUCKS
Ohio Galvanizing & Mfg. Co., Niles, Ohio

HOISTING APPARATUS
Reynolds Mfg. Co., Springfield, Mo.

ICE BAGS
Union Bag & Paper Corp., New York, N. Y.

ICE BLOWERS
Gifford-Wood Co., Hudson, N. Y.

ICE CAN FILLERS
Frick Co., Waynesboro, Pa.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Martocello & Co., Jos. A., Philadelphia, Pa.
Ohio Galvanizing & Mfg. Co., Niles, Ohio
Refrigeration Engineering Corp., Philadelphia, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

ICE CANS
Frick Co., Waynesboro, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Martocello & Co., Jos. A., Philadelphia, Pa.
Ohio Galvanizing & Mfg. Co., Niles, Ohio
Refrigeration Engineering Corp., Philadelphia, Pa.

ICE CHIPPERS
Gifford-Wood Co., Hudson, N. Y.
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Co., Minneapolis, Minn.
Refrigeration Engineering Corp., Philadelphia, Pa.
United Ice Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CHUTES
Frick Co., Waynesboro, Pa.
Gifford-Wood Co., Hudson, N. Y.
Jamison Cold Storage Door Co., Hagerstown, Md.
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.

ICE CONVEYORS
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.
Refrigeration Engineering Co., Minneapolis, Minn.
United Ice Supply Co., Boston, Mass.

ICE CREAM PLANTS
Baker Refrigeration Corp. So. Windham, Maine
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

ICE CRUSHERS
Bateman Foundry & Machine Co., Inc., Mineral Wells, Texas
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United Ice Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CUBE CONTAINERS
Lilly Co., The, Memphis, Tenn.
Union Bag & Paper Co., New York, N. Y.
United Ice Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CUBERS
Flynn & Emrich Co., Baltimore, Md.
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.
Thermo Cuber Co., Chicago, Ill.
United Ice Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CUBING MACHINES
Flynn & Emrich Co., Baltimore, Md.
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.
Thermo Cuber Co., Chicago, Ill.
United Ice Supply Co., Boston, Mass.

ICE DELIVERY BAGS
Everd Co., H. D., Ft. Wayne, Ind.
Gifford-Wood Co., Hudson, N. Y.
Index Coupon & Supply Co., La Porte, Ind.
Lilly Co., The, Memphis, Tenn.
Martocello & Co., Jos. A., Philadelphia, Pa.
Pittsburgh Waterproof Co., Pittsburgh, Pa.
Union Bag & Paper Corp., New York, N. Y.
United Ice Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE ELEVATORS AND CONVEYORS
Gifford-Wood Co., Hudson, N. Y.

ICE HARVESTING MACHINERY & TOOLS
Gifford-Wood Co., Hudson, N. Y.
United Ice Supply Co., Boston, Mass.

ICE MAKING AND REFRIGERATING MACHINERY
Baker Ice Machine Co., Inc., South Windham, Maine
Creamery Package Mfg. Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc. Chicago, Ill.
Frick Company, Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.
Reynolds Mfg. Co., Springfield, Mo.
Vogt Machine Co., Henry, Louisville, Ky.

ICE PICKS AND PLANERS
Gifford-Wood Co., Hudson, N. Y.
Index Coupon & Supply Co., La Porte, Ind.
Lilly Co., The, Memphis, Tenn.
Martocello & Co., Jos. A., Philadelphia, Pa.
United Ice Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE PICK SCABBARDS
Gifford-Wood Co., Hudson, N. Y.
Martocello & Co., Jos. A., Philadelphia, Pa.
United Ice Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE PLANTS
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Refrigeration Engineering Corp. Philadelphia, Pa.

ICE RECORDING MACHINERY
Jamison Cold Storage Door Co., Hagerstown, Md.

ICE SCALES
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.
Martocello & Co., Jos. A., Philadelphia, Pa.
United Ice Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE TOOLS
Gifford-Wood Co., Hudson, N. Y.
Index Coupon & Supply Co., La Porte, Ind.
Lilly Co., The, Memphis, Tenn.
Martocello & Co., Jos. A., Philadelphia, Pa.
United Ice Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE VENDORS
Dickinson & Co., F. B. Des Moines, Ia.
Frick Company, Waynesboro, Pa.
Jamison Cold Storage Door Co., Hagerstown, Md.
Refrigeration Engineering Co. Minneapolis, Minn.
S & S Vending Machine Co., San Jose, Calif.
Thermo Cuber Co., Chicago, Ill.
United Ice Supply Co., Boston, Mass.

ICED DISPLAY CASES
(See Display Cases)

INSTANTANEOUS HEATERS
National Pipe Bending Co., New Haven, Conn.

INSULATING MATERIALS
American Hair & Felt Co., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa.
Mundet Cork Corp., Brooklyn, N. Y.
Pacific Lumber Co., San Francisco, Calif.
Pittsburgh Corning Corp., Pittsburgh, Pa.

LOW TEMPERATURE EQUIPMENT
(See Ice Making and Refrigerating Machinery)

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Ohio Galvanizing & Mfg. Co., Niles, Ohio
The Mote-Trac Co., Cleveland, Ohio

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★ NO ODORS
★ NO FLAVOR TRANSFERENCE

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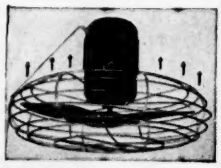

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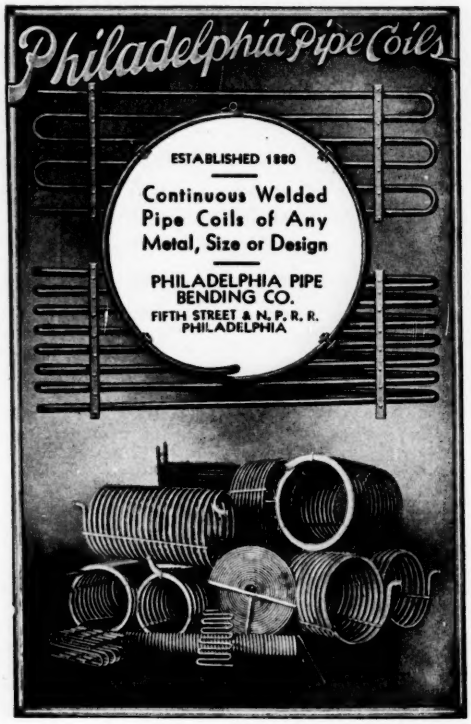
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THE BUYERS

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OIL AND LUBRICANTS
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Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.

OILS, CUTTING
Socony-Vacuum Oil Co., Inc., New York, N. Y.
Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.

OIL SEPARATORS
King-Zeero Company, Chicago, Ill.
Rex Engineering & Sales Co. Oklahoma City, Okla. Baltimore, Md.

OILS, FUEL
Socony-Vacuum Oil Co., Inc., New York, N. Y.
Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.

PACKINGS
Frick Company, Waynesboro, Pa.
Vivian Mfg. Co., St. Louis, Mo.

PALLET TRUCKS (MOTORIZED)
The Moto-Truc Co., Cleveland, Ohio

PIPE COILS AND BENDS
Acme Industries, Inc., Jackson, Mich.
Chicago Nipple Mfg. Co., Chicago, Ill.
Frick Company, Waynesboro, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Pittsburgh Pipe Coil & Bending Co., Pittsburgh, Pa.
Rempe Company, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

PIPE COVERING
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PIPE WELDING
Acme Industries, Inc., Jackson, Mich.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Pittsburgh Pipe Coil & Bending Co., Pittsburgh, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

PIPING
Acme Industries, Inc., Jackson, Mich.
Byers Co., A. M., Pittsburgh, Pa.
Frick Company, Waynesboro, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Pittsburgh Pipe Coil & Bending Co., Pittsburgh, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.
Rempe Company, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

PISTON RINGS
Frick Company, Waynesboro, Pa.

PRESSURE BLOWERS
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.
Roots-Connersville Blower Corp., Connersville, Ind.

PROPELLERS
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.

PUMPING MACHINERY
Aurora Pump Co., Aurora, Ill.
Deming Co., The, Salem, O.
Layne & Bowler, Inc., Memphis, Tenn.
Refrigeration Engineering Corp., Philadelphia, Pa.
Roots-Connersville Blower Corp., Connersville, Ind.

PUMPING MACHINERY—AIR LIFT
Deming Co., The, Salem, O.
Martocello & Co., Jos. A., Philadelphia, Pa.
Roots-Connersville Blower Corp., Connersville, Ind.

PUMPS, AMMONIA AND BRINE
Baker Refrigeration Corp., So. Windham, Maine
Deming Co., The, Salem, O.
Frick Company, Waynesboro, Pa.
Roots-Connersville Blower Corp., Connersville, Ind.
Vogt Machine Co., Henry, Louisville, Ky.

PUMPS, DEEP WELL
Deming Co., The, Salem, O.
Layne & Bowler, Inc., Memphis, Tenn.

PUMPS, ROTARY
Aurora Pump Company, Aurora, Ill.
Deming Co., The, Salem, O.
Martocello & Co., Jos. A., Philadelphia, Pa.
Roots-Connersville Blower Corp., Connersville, Ind.

PURGERS
Armstrong Machine Works, Three Rivers, Mich.
Frick Company, Waynesboro, Pa.
Rex Engineering & Sales Co. Oklahoma City, Okla.

RAW WATER FREEZING SYSTEMS
F.-P. System—Frick Co., Waynesboro, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

REBOILERS
Frick Company, Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

REFRIGERATED ICE STATIONS
Dickinson & Co., F. B., Des Moines, Ia.
Refrigeration Engineering Co., Minneapolis, Minn.
S & S Vending Machine Co., San Jose, Calif.

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Perfection Ice Scoring Machine Co., Fort Worth, Texas
United Ice Supply Co., Boston, Mass.

SECOND HAND MACHINERY AND SUPPLIES
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
United Ice Supply Co., Boston, Mass.

SEPARATORS OIL, STEAM AND AMMONIA
Acme Industries, Inc., Jackson, Mich.
Frick Company, Waynesboro, Pa.
King-Zeero Company, Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Vogt Machine Co., Henry, Louisville, Ky.

SHOULDER PADS
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.
United Ice Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

SIZED ICE EQUIPMENT
Bateman Foundry & Machine Co., Inc., Mineral Wells, Texas
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.
Vivian Mfg. Co., St. Louis, Mo.

SPRAY COOLING SYSTEMS
Binks Mfg. Co., Chicago, Ill.

SPRAY NOZZLES
Barada & Page, Inc., Kansas City, Mo.
Binks Mfg. Co., Chicago, Ill.
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.

SPRAY PONDS
Binks Mfg. Co., Chicago, Ill.
Frick Company, Waynesboro, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.

STORAGE HEATERS
National Pipe Bending Co., New Haven, Conn.

STRAINERS
Martocello & Co., Jos. A., Philadelphia, Pa.

TANKS
Frick Company, Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

TARPAULINS
Lilly Co., The, Memphis, Tenn.
United Ice Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

THERMOMETERS
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.

TIERING MACHINES
Gifford-Wood Co., Hudson, N. Y.

TRAPS, OIL & STEAM
Armstrong Machine Works, Three Rivers, Mich.

TRUCKS, MOTORIZED LIFT
The Moto-Truc Co., Cleveland, Ohio

UNIT COOLERS
Acme Industries, Inc., Jackson, Mich.
Howe Ice Machine Co., Chicago, Ill.
Niagara Blower Co., New York, N.Y.

USED MACHINERY
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.

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Alco Valve Co., St. Louis, Mo.
Frick Company, Waynesboro, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Martocello & Co., Jos. A., Philadelphia, Pa.
Phillips & Co., H. A., Chicago, Ill.
Refrigeration Engineering Corp., Philadelphia, Pa.
Rempe Co., Chicago, Ill.
Shank Co., Cyrus, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.
Voss, Inc., J. H. H., New York, N.Y.

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Niagara Blower Co., New York, N.Y.

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WATER TREATMENT MATERIALS
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Pittsburgh Pipe Coil & Bending Co., Pittsburgh, Pa.
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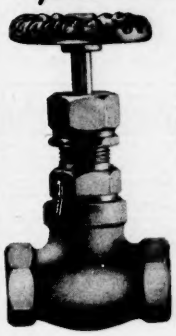

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POSITION WANTED—By operating engineer for ammonia plants, steam or electric, preferably ice, cold storage or packing house plants. Married, 32 years old. Sixteen years experience. Satisfaction guaranteed. Must have housing accommodations. Will go anywhere within U.S.A. Available within 30 days. Address Box OT-3, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

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FOR SALE—Brand new ammonia compressors, one 8" x 8" Frick, three 5" x 5" Worthingtons, all of latest high speed type and include V belt drives. Priced right. Address Box OT-15, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44.

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1—6" x 6" two cylinder Frick ammonia compressor, high speed.
1—6" x 6" two cylinder Voss high speed ammonia compressor.
1—5" x 5" two cylinder York high speed ammonia compressor.
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	Item No.
1—5x5 York, 200 RPM	16
6—6x6 York's, 200 RPM	20
1—6x6 Frick, 257 RPM	21
2—6½x6½ Arctics, 350 RPM, forced feed lub.	30
1—7¼x7¼ Baker, 350 RPM, forced feed lubrication	35
1—7x7 Frick, 200 RPM	40
1—7½x7½ York, 225 RPM	50
1—7½x7½ York, 200 RPM	51
1—8x8 Arctic, 300 RPM. forced feed lub.	60
1—9x9 Arctic, 300 RPM, forced feed lub.	62
1—9x9 Frick 225 RPM direct connected to a 60 HP synchronous motor, forced feed lubrication	67
1—9x9 Frick, 200 RPM	70
1—9x9 York, 200 RPM	71
1—9x9 Worthington, 325 RPM, forced feed lub.	72
1—10x10 De La Vergne, 360 RPM. forced feed lub.	73
1—10x10 De La Vergne, 300 RPM, Forced Feed Lubrication	76
1—10x10 York, 257 RPM, forced feed lub.	80
1—10x10 Carbondale, 100 HP synch. motor, 350 RPM	81
3—10x10 York's, 225 RPM, semi-forced feed lub.	82
1—11x13 York, 164 RPM, forced feed lub.	90
1—17x18 Frick, direct conn. 300 HP synch. motor	91

Diesel Driven and Diesel Engines

1—8x8 York—Direct connected to 50 H.P. Fairbanks-Morse at 257 R.P.M.	210
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1—18 ton Vertical 6½x6½ Arctic	321
1—250 ton Horizontal De La Vergne—18x24—with Ames Una Flow engine	325
1—7½x7½ Vertical York, 200 R.P.M. direct connected to steam engine	326
1—8x8 Vertical York, 300 R.P.M. direct connected	327

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10,000 feet wrought Iron pipe—2"—like new	451

Scoring Machines

2—Giffords wood	512

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	Item No.
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Brand New 8 to 10-ton Clear Ice-Making Plants—110 Cans—Electric or Diesel Drive—2 Can Pull	632
3—*247 Can, 22-ton ice plants, like new*	632A
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2—3x3 York & Frick—390 R.P.M.	741
2—4x4 Yorks—390 R.P.M.	742
1—5x5 York—390 R.P.M.	743
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Brine Coolers

1—34x12—96—2—Retubed	801
1—34x10—100—2	802
1—48"x16'—130—2" tubes	808

Condensers

3—100 ton shell and tube condensers retubed	919
2—Stands—Vogt Multi-tube—Each stand 6 pipes high. Each pipe 9"x18" with 7—2" tubes	920
1—125-ton, Vertical Shell & Tube, 196 2" tubes	921
1—120 ton, 216—2" retubed Vertical Shell & Tube	922
1—50 ton Horizontal—retubed	923
2—20 ton Horizontal—retubed	924

Ice Cans

96—11½"x22½"x46"—Refinished in zinc
400—11½"x22½"x44"—cap refinished in zinc

Ice Cubers

1—100 lb. Uline Automatic Cuber

Motors

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3x3 to 5 x 5 —390 R.P.M.	1001
6x6 to 10x10—390 R.P.M.	1002
3x3 to 5 x 5 —Self-contained units, complete	1003
5x5—Self contained—15 H.P. motor—V Belt	1004

Ammonia Condensers

4—12¾x12 Horizontal—36—1¼" tubes	1020
2—30x14 Vertical 109—2" tubes	1021
1—16"x10"x10' Shell and Tube Condenser, 60 1¼" tubes	1022

Evaporative Condensers

20-40-50 ton condensers	1030

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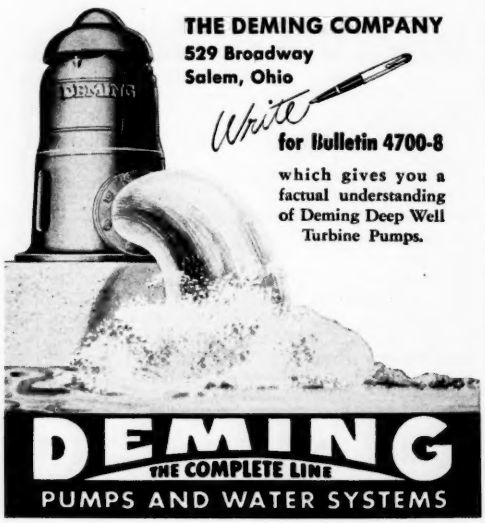

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THE COMPLETE LINE
PUMPS AND WATER SYSTEMS

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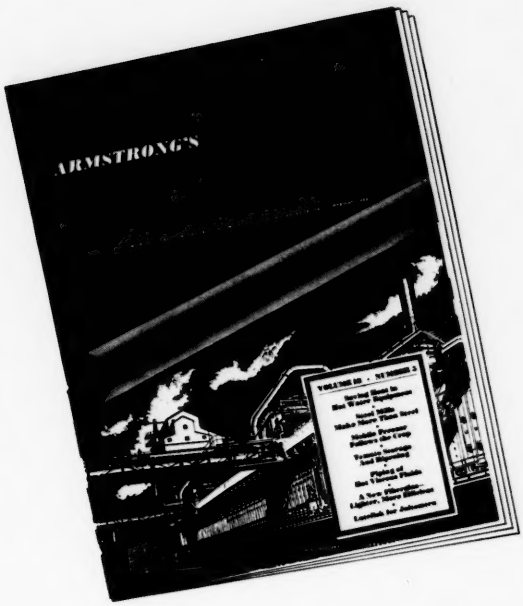

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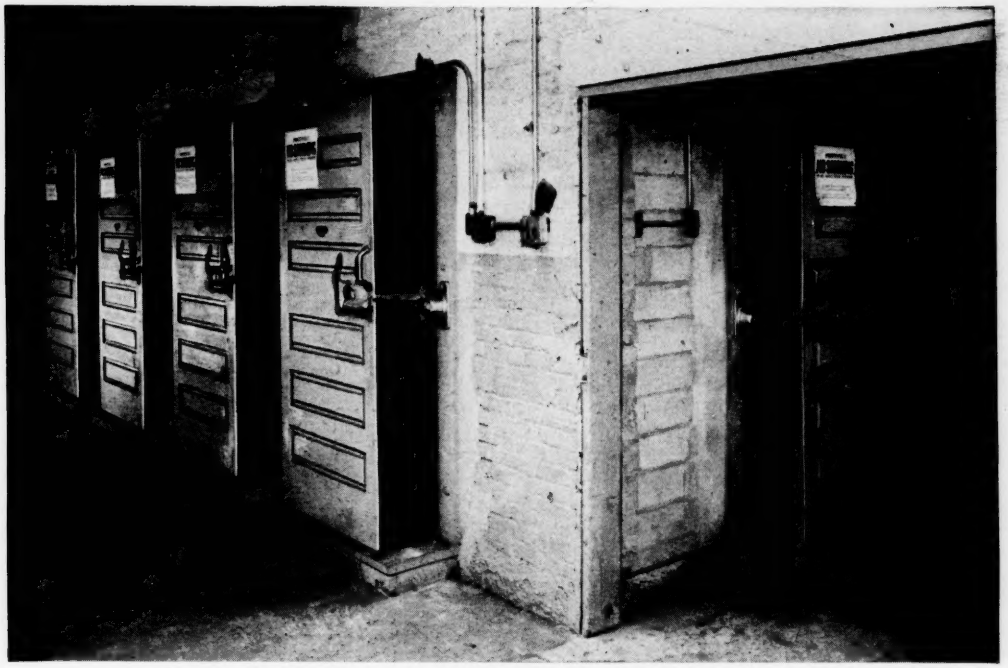

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